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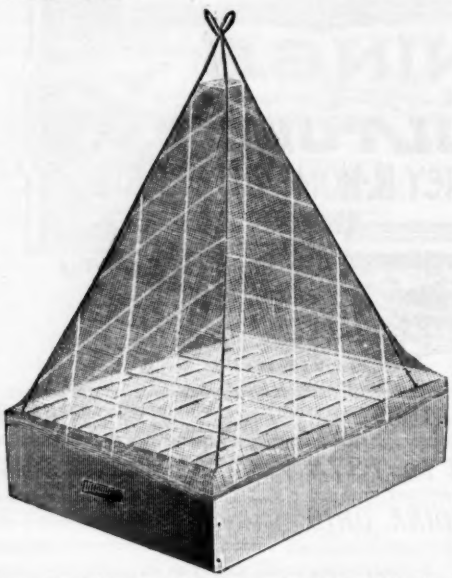
OUT-APIARIES, NO. XVIII.

HARVESTING.

WHEN extracting at an out-apiary it would be very convenient to have a house in which to extract, as you have been used to doing, perhaps, at home. Very likely, however, you will conclude that the inconvenience to the people will be more than the convenience to you. In a good season you may find little difficulty in extracting in the open air. But if you are not an old hand at the business, I warn you to be very careful about getting the bees to robbing. If a single bee gets a load from one of your combs you are likely to get into trouble. Have robber-cloths, and keep every thing you can covered up. If to-day you get along all right, with no appearance of robbing, try it the same way next time, only be sure to set your extractor in a different place, for in the interim some bees may have had a taste of the drippings that you left in the old place, and will be on the lookout for more. Have plenty of water, and keep every thing clean. Remember it's only when bees are busy gathering, that you can extract in the open air, and sometimes they gather only in the forenoon. Possibly it may not be wise for you to attempt extracting at all, without cover, unless you are a very careful person; and, no matter how careful you are, it is only sometimes that you can be safe to operate outdoors. At all other times you can use a tent, even if you do feel cramped for room. Perhaps you think I lay more stress on the danger of robbing than I should. I hardly think so, for it is even more important at out-apiaries than at home. At home, if the bees get to robbing when you are nearly through work in the afternoon, you can stop and finish the job the next morning; but you can't work that way when you are running several apiaries. Besides, it's worse to start robbing where other people live.

In harvesting comb honey at an out-apiary, allow me to suggest that it is quite important that you should be careful not to get robbing started, especially toward the close of the season. Oftentimes you will do well to manage quite differently from the home plan. It may be you find several supers of sections (remember, when I say super it may contain wide frames or what not), ready to come off just before you are through your day's work, and you are quite anxious to take them home with you. Give the super a heavy smoking before taking it off the hive, so as to drive down all the *young* bees; then after the super is taken off, one hand can make a steady application of smoke while the other plies the brush. Another way is this: After taking the super from the hive, having given it the smoking first spoken of, put it on the top of another super that is to be taken off, say on No. 21. In the same way you can pile them on No. 21 till it is as high or higher than your head, so you must get something to stand on to get at the upper one. When all are piled up in this way, load your smoker for business and play away on the top without a moment's cessation, driving the smoke down into every opening, and after a little while an assistant can take off this upper super with not a bee in it. But the smoker must keep at work while this super is being taken off, playing away on the one next under it, which has already been strongly affected by the smoke driven through the upper one; and by the time the assistant has disposed of the upper super, the next will be ready to come off, and so on. When you get down to the last one that is to be taken off, the bees will probably not all leave it so readily; and if you have another pile ready to take off, it may be best to put this last super on the next pile. Instead of putting the pile on a hive you may think best to start it on the ground. Usually, however, it is best to make these piles on hives and leave them till the next day you come. Then in the

morning drive down the bees tolerably clean, make a pile of supers on the ground, a hive-cover or something of the sort under them, and put on top of the pile one of the little tents already described in GLEANINGS.



DR. MILLER'S ARRANGEMENT FOR GETTING BEES OUT OF SUPERS.

Make as many of these piles as the number of your little tents will allow; for the higher the pile, the slower your bees will be in getting out. Go through the apiary and take off all that are ready, and put them in piles under the little tents, and by the time you are ready to go in the afternoon all will be clear. If any supers are taken off so late in the day that there is not time enough for the bees to get out, put them in piles on hives, and take them off the first thing when you go next time. Look out not to start the bees to robbing when putting your load on the wagon. If the bottom of your wagon-box is not bee-tight, lay cloths or newspapers on it, so no bee can get up from below, and keep every thing on the wagon covered up all the while with robber-cloths, tarpaulin, buffalo robe, or something of the kind. If, in spite of all your precaution, the bees are pretty thick about the wagon, after the load is on, draw it some distance by hand, hitch on with a jerk, and start.

Marengo, Ill. C. C. MILLER.

No, doctor, you do not lay a bit too much stress on this matter of robbing. It is almost the only thing I am afraid of when I see new hands start in bee-keeping. Getting stung themselves, and learning some bitter lessons from sad experience, is a small matter comparatively, when we think of annoying the whole neighborhood. Again and again have I heard people declare they hate bees, and do not want to get within a mile of them, simply because somebody had left some honey around, or had left a hive open. Of course, the great outside world do not stop to reflect that the special annoyance may be only temporary. They take it for granted that bees are always vicious, and that their sole delight is in inflicting pain on everybody around, without sense or reason.—There, doctor, there is another thing you did not show me when I made my visit. I did not see one of those little bee-tents.

DOORYARDS FOR THE BEES.

FRIEND BOARDMAN GIVES US SOME SENSIBLE HINTS IN THE MATTER.

"ED, get a shovel and come here, and I'll tell you about a job I've been thinking of this morning."

The creaking of the foot-power grindstone about a minute later told that Ed had anticipated the nature of the work I had been thinking about, and was sharpening the shovel ready to begin.

"All ready! Well, now, I have been thinking about making some nice dooryards for the bees, in front of each hive, by removing the turf, or surface dirt, a little, just enough to make a smooth hard surface, and get below the grass roots so it will not grow again this season. About two feet square, I think, will be about right. There are a great many bees, in returning from the fields, that fall short in their flight, and drop down in the bee-yard in front of their hives, and sometimes at a considerable distance from home, and they depend upon walking in somewhat as A. I. Root does sometimes on his return from a bee-keepers' convention, when he fails to make connection, and gets dropped out five or ten miles from the Home of the Honey-bees.

"The number that fall short in their homeward flights is much greater during a honey-flow where they come home heavily laden. It is then, too, that their time is most valuable. Of course, the time of an individual bee is very insignificant. It would not balance the scales one way or the other in the weight of a large honey crop, which is, after all, made up entirely of little tiny drops brought in by individual bees. I have often watched them when falling down in this way in the grass, and have seen them struggle and scramble along over the innumerable obstructions in their way. Even though the grass is short and smooth, they spend a great deal of time, and make very slow progress. This kind of work looks like very poor economy for the bee-keeper, and it is."

Now, Mr. Editor, when you get left a few miles from home, with business pressing, and you are anxious to get home with as little delay as possible, and decide to push on with the power nature has provided you with, does the kind of roads you have before you make any difference with you? I dare say it is the very first thing you think of. "How is the road?" more than probable you inquire. Now, suppose, instead of a smooth even road, you were dropped in some dismal swamp or jungle or windfall that you had to scramble through the whole distance. You would then be in much the same plight as is the tired bee that falls in the grass.

"There, now, Ed, that looks about right. I think I shall like that. I have tried almost every plan I could think of to keep the space in front of the hives in shape to accommodate the little fellows. I have not yet been quite satisfied with any of the plans I have tried. I have cut the grass, scalded it with hot water, salted it, have put ashes and vari-

ous other things upon it to keep it down. I have used sawdust about the hives; I have even strewn salt lightly over the yard to induce the cow and horse to feed it down, which they very soon learned to do at night, when the bees would not molest them. This plan, as simple as it may seem, has much to recommend it when it is convenient to practice it. It is worthy of a trial. Don't think your hives will be all upset. Your cow or horse will learn to be as careful about the hives as any one doing the same work. I have had sheep turned in to one of my out-apiaries at different times for several years. They are the most reckless of any animals I have ever tried among the hives, even more so than hogs. A sheep seems never satisfied to keep away from the bees. The hog needs only one lesson.

"Now, Ed, I'll go over to the office and get the mail. I shall not be gone long, as I am interested in the work just begun in the bee-yard.

"Why, this isn't going to be a very long job. You have got 2, 4, 6, 8, 9, 10, 11, done already. How much better that will be for the bees that fall in front of the hive than grass! How nice it would be to have the yard peeled all over just that way! Just wait a moment. I am half decided to have you make a clean job of it. To be sure, it will be quite a job; but there is no work particularly urgent at present, and I've long wanted to make this yard a model. Just you begin over there at the corner, between those two rows of hives, and see how much work it will be, and how it will look. I shall be back in a moment, as soon as I can take a look at the new mammoth wax-extractor. I declare! if we don't get different weather, there won't be sunshine enough to test it this summer. There has been nearly two weeks now that the wax has not melted enough to run. At this rate the moth worms will eat up all of my combs before they can be melted out. I will just wheel it out between the buildings in that open space, where the sun shines stronger." H. R. BOARDMAN.

East Townsend, Huron Co., O.

Old friend, you have hit me exactly in the above. I have studied and experimented, and I am sure it pays to have a good door-yard; but it is a harder matter than you think, to make one that will be permanent. It is not a very big job to take a sharp shovel and go over the apiary, say once in two weeks, in the growing season; but some way there are very few who do it. Sawdust is objectionable, as has been explained. White sand does better, but the weeds grow up through it. Not long ago I suggested sawed flagging. For our locality, pieces, say 15 x 20 or 18 x 24 would not cost very much. I think, however, that slate would be still cheaper. but the latter would be in danger of breaking if a heavy man like Doolittle and some of the rest should step on them; and I believe I would rather have the sawed flagging besides. Will some one who is in the quarry business please tell us about what it would cost? We will also make inquiries. Yes, friend B., it does make a difference with me whether I have a good road to walk on or not; and I think more about it now since I am getting well along in years than I used to. From the creek garden to the house there is a nice, smooth, well-trodden path, but it has a good many windings. A great many times, when weary, I ask myself which I shall do —take a straight line for the house, over the soft ground, or go nearly twice as far to follow the hard well-trodden path. I believe it tires me less to take the longer route; and I am sure it is very poor economy to make our bees travel or take wing again when they fall around the entrances. Through California and Wisconsin I watched the apiaries to see what provision had been made for an alighting-place. A good many used boards; but by far the greater part did nothing at all; and where an apiary was literally choked up with weeds and brush, I knew beforehand that the owner would tell that it "did't pay expenses." I don't believe I like cows or horses in an apiary, and I am sure I do not like rabbits, as friend Fradenburg has advised. The greatest trouble with rabbits is, that there are soon too many of them. I hope you will tell us more about that mammoth wax-extractor.

DOOLITTLE'S REPORT FOR 1889.

GIVING THE DARK SIDE.

A BEE-KEEPING neighbor happened in a few days ago, and, in speaking of the poorness of the season, he said: "You will not report this season, I suppose, owing to the light crop of honey which you have; for I notice that there are not many who go into print with a report unless they have a very large crop." I told him I should give my report again this year the same as I always had, for I did not consider it the fair thing for a bee-keeper to do, to tell of his large yields only, and then censure the editors of our bee-publications for giving only the "bright side" of apiculture, as some have been known to do, when bee-keepers gave only the largest yields, withholding a report at all other times. Only as reverses are reported equally with the large yields, can we get a true idea of the value there is in apiculture as a pursuit; and he who purposely withholds the dark side of any matter must be considered one who would purposely deceive. I am glad to know, however, that the most of those who report for our bee-papers are generally willing to give the dark as well as the bright side of bee-keeping.

The season of 1889 has been a peculiar one. The month of March, which, as a rule, is the most rough and unpleasant month of the whole year, in this locality proved to be the most calm and pleasant of any we have had so far, considering the time of year. This gave the bees which were outdoors an early start; and as April continued nearly as fine, high hopes were entertained for the season of 1889 as a honey year. Very few cold storms occurred up to May 20, at which time the bees had so advanced that some of the stronger colonies were thinking about swarming, they having queen-cells started while the weaker ones were fully as good as the strongest are usually at this season of the year. But, alas! the shortness of human vision is such that it can not foretell what the season will turn out to be; hence, right in the midst of our high hopes came the most disastrous weather for the bees that I ever experienced; for on May 20th came a cold rainstorm which kept the bees in their hives for a whole week, at the end of which it froze so hard that the bees in the smaller colonies were

obliged to contract to such an extent that much of the brood perished, while all of the colonies ceased breeding pretty much entirely. This weather continued to a greater or less extent together with much rain till June 12th, at which time the prospect of a honey crop was nearly ruined; for all know that it is the bees which hatch from the eggs laid by the queen about 37 days before the honey harvest, which procure the crop, if we are to have any. As our basswood (which is our main honey crop) blooms about July 10th, it will be seen that this almost entire absence of brood from May 20th to June 12th took away the bees which should have been the gatherers of our honey, so that, no matter how good the weather might have been during basswood, it would be impossible to secure a full crop. June 12th there came better weather, and the bees (which by this time were broodless, and many of them nearly honeyless) went to the fields to work with a will. The rainy weather had brought on the white clover so that there was a greater show of bloom than we usually have; and could it have come off dry at this time we might have obtained more than usual from this source; but as the weather still continued wet, little more was obtained than enough to feed the brood, which now multiplied very rapidly. The early spring brought out the basswood bloom earlier than usual, so that the flowers on the earliest trees opened on the 4th of July, but the bees did not seem to notice them much if any till nearly a week later. They now began to gather honey quite rapidly; in fact, they came in as heavily loaded as I have ever seen them, dropping short of the hive, and tumbling about in every direction, as they always do when getting honey very fast; but when it came to their storing it in the hives and sections, very slow work indeed was made, owing to the fewness of the laborers, and also to the thinness of the nectar, this last being caused by its raining nearly every day at some period during each 24 hours. The basswood bloom lasted for about three weeks, at the end of which time teasel gave a little honey for a week or so, when the honey season from flowers was over for 1889, for of late years we get no honey from buckwheat or fall bloom.

I now took off all of the sections, and found that the bees did not have half enough honey in the brood-apartment of the hive to winter them; for, owing to the slow way honey had come in, brooding had been kept up to a much greater extent than usual during July. I saw nothing ahead but feeding for winter, till about the 28th of August, when the bees appeared to be at work on something, enough to keep them from robbing, the yield increasing, till on September 1st they again dropped about the hives nearly as much as they did during basswood bloom. An investigation of the matter proved that this honey came from the leaves of the oak, elm, and hickory trees, growing in a large piece of woods about 1½ miles distant, this being the first honey-dew honey ever obtained by my bees during the period of 20 years which I have kept bees. From this source, which lasted for about 12 days, the bees filled up their hives so that they had enough to winter on; and although I have some fears regarding how they will come out next spring, I have concluded to let them chance it, rather than go through the work of extracting, and feeding high-priced sugar.

After my sales of bees and queens in early spring, I found I had 26 colonies left to begin the season with, and from these I obtained an increase of 18 colonies, which, with 4 colonies made by doubling up nuclei, gives me 48 to go into winter with. Besides the increase, I obtained 651 lbs. of comb honey and 103 pounds of extracted, or 754 in all, from the 26 colonies in the spring. This gives an average of 29 pounds to each colony, which is the lightest yield I ever obtained, if my memory serves me right. The comb honey I have shipped on commission, which is being sold at 17 cts. per pound.

G. M. DOOLITTLE.

Borodino, N. Y., Oct. 21, 1889.

I suppose we are not to understand, friend D., that 754 pounds was your sole income for the season's work. Quite likely your sale of bees and queens amounted to a good deal more than that sum. I presume we are to understand that the 26 colonies you mention were worked solely for honey, and did not furnish bees and queens to fill orders during the summer time. If so, then you certainly have had an exceedingly poor season; and, by the way, while I recommend selling bees and queens where the opportunity offers, as well as honey and wax, I feel pretty certain also that a traffic in bees and queens is pretty sure to interfere more or less with the best results in the way of honey. Where one has a large apiary or out-apiaries, however, very likely it would not pay him to fuss with the bee and queen trade at all, on the principle that it is better to do one thing well than to try to do too many things.

HONEY-EXTRACTORS.

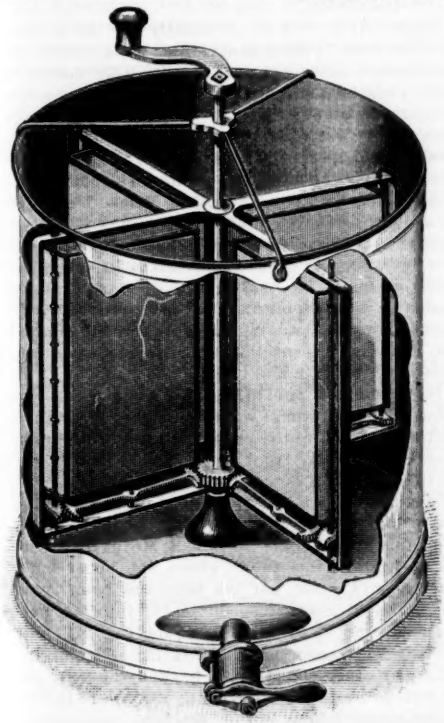
THEIR CONSTRUCTION; THE REVERSIBLE EXTRACTORS IN PARTICULAR.

HAVING tried nearly all kinds of extractors, from the most primitive two-comb up to an eight-comb reversible, I think my experience might be of some value to any one contemplating the purchase or manufacture of a new machine. My first extractor consisted of two tin boxes, each the length of my hive, 4 in. deeper and 4 in. wider, fastened to a wooden frame about 18 in. apart, with an axle in the center between the two cans, and a crank on top. Each can had a piece of coarse wire cloth, the size of the frame across the center of the can lengthwise, to keep the comb from the outside, and a screw cap on the bottom to let the honey out. I drew off the honey into milk-pans, and poured it through a cheese-cloth strainer into a barrel. Yes, and I believe I had more enthusiasm when running that thing, and extracting 200 or 300 pounds per day, than I have now with the best kind of an outfit, and extracting 2000 or 3000 lbs. per day.

I next tried a Novice. As most of you know its good and bad qualities, I will not mention them.

The next was a four-comb reversible. I found this a great improvement over the non-reversible, not only in saving time, but in saving combs; for with the former the comb sometimes presses into the wire cloth when you extract the first side; and, if tender, will often pull out of the frame when you pull it loose; but with the latter, the centrifugal force pulls evenly on the whole comb until it comes loose, and combs are very seldom broken.

Next my neighbor, Mr. Dudley, had a six-comb reversible made, with a ring around the axle, and a small chain running from the ring to the out end of each basket. The idea was, to pull up on the ring and make all the baskets turn at once; but it did not work. The baskets hit each other, and became tangled almost every time you tried to reverse it; so he took the chains off and reversed the baskets one at a time. Then my father-in-law, Mr. Wilkin, wanted an eight-comb reversible, and concluded to build it himself if I would help. I did so, and we put up probably the first eight-comb extractor in the country; but the baskets had to be reversed one at a time. We found that it required more force to throw the honey out when the combs made a large circle than it did when the circle was smaller, and the machine made the work harder than a four-comb. To illustrate: When I was a boy we made what we called a "whirligig" by boring a hole in the center of a plank and placing it on a post about three feet high, and driving a pin down



M'INTYRE'S REVERSIBLE EXTRACTOR.

through the hole in the plank into a hole in the top of the post. One boy would get on each end of the plank, and a third would push it around; if the plank was short, the boy pushing could make the other boys fly off the end of the plank in spite of all they could do to hang on; but if the plank was long, he could not throw them off. After trying all sizes up to eight combs, I would take a four-comb in preference to any other size, at the same price.

Then Mr. Stanley came out with his patent automatic reversible. My neighbor, Mr. Kenney, has one, and it is a well-made machine, but it is not quite so handy to put the combs in and take them out as it is when the side of the comb is toward you, and the baskets often hit each other in reversing.

Next Mr. Squire, of Santa Barbara, Cal., came out with a very simple arrangement for reversing the comb-baskets all at once. He made some hardwood wheels, about three inches in diameter, with two grooves around the edge, and fastened them securely on the axles of the comb-baskets; then put a screw in the edge of each wheel between the grooves, directly under the basket; then a wire was passed from one wheel to another, going around each wheel once. When it came to the screw it was wound around that to keep it from slipping. This acted like a belt; and when one basket was turned, all turned.

Mr. Hugh Warring, of this county, improved Mr. Squires' extractor by making the main axle loose, putting another wheel on it and passing the wire around this wheel also, which enabled the operator to reverse the comb-baskets without touching them by simply reversing the crank. This extractor worked well; the comb-baskets would reverse easily, and never touch each other; but the strain of stopping and starting all came on the wire, which would often break and give the bee-keeper the bother of having to stop and put another on.

One night, while thinking of this extractor, the idea popped into my head how to make an extractor without either wire or wood wheels, that would work the same as this one. Next morning I made a wooden model to see how it would work. The model worked beautifully, and some of my friends advised me to get it patented. I said, "No, I will never be a patent-right vender, and I don't want to go into the manufacturing business; besides, I have been greatly benefited by the ideas of others; and if some one should be benefited by my idea it will not grieve me a particle." But I wanted an extractor made that way, so I took the model down to Ventura and told the tinner I would let him have it on condition that, if he made the extractors to sell, he should give me one of them. When I took out the model and gave it a few turns, he said, "When do you want your extractor?" He made and sold them with the Stanley standing beside them. Most customers took mine because they reversed so much easier and nicer, and the baskets never touched each other, although Stanley's was much better made. The idea that struck me was to turn each basket from the center axle by means of a small lever running out on the arm that supports the basket. The frame that holds the baskets is loose on the center axle, but supported on the same by a collar shrunk on near the lower end. I inclose a drawing of the reversing gear, which will help to make it clear. The wheel in the middle is keyed fast to the main axle. The little half-wheels on the outside are fastened securely to the axle of the baskets. They should be two inches in diameter, and the one in the center four inches. The levers between, with the cogs on each end, should be malleable cast, and have a little hub in the middle where the pivot comes up through that they turn on. They vary in length according to the width of the comb to be extracted. As the gear stands in the diagram, the comb-baskets would be pointing to the center, or standing directly over the levers, and their inner edge should come about even with the edge of the middle wheel. J. F. McINTYRE.

Fillmore, Cal., Sept. 2, 1889.

Friend M., you are perhaps aware that I made the first metal honey-extractor in the world—at least so far as I know. For sev-

eral years I was constantly experimenting on different distances from the center-shaft, also with an extractor to be turned with a crank directly on top of the shaft, instead of being connected with gearing; with extractors to hold three or four frames instead of two; extractors to be run by power applied to the bottom and on top; with a belt or strap to unwind, etc. Now, it is a little encouraging to know that my experiments agree almost exactly with yours. At first we made our Langstroth-frame extractors with the combs on end, standing quite near the shaft, that we might use a can of tin made of a certain size and thus get the extractor up cheaply. After we had made and sold a good many of these, however, I had an opinion that a larger can, with combs further away, would give better results; but as they cost more, I did not make many of them. I was somewhat surprised, however, to find that a four-frame extractor did not throw out the honey better, and also that it can not be started and stopped as quickly as the old-style two-frame extractors. After I had been making them some years, Gray and Winder, Murphy, Peabody, and others, made extractors where the can revolved instead of the frame. I decided at once that all these were a mistake. I did, however, test them quite extensively. The Peabody was so neat looking and so substantial, I invested in half a dozen of them; but they were so much more laborious, compared with our light cheap extractors, that they were soon laid aside. Now, then, whenever you revolve four combs, or get your two combs too far away from the center-shaft, or whenever you revolve a heavy frame to hold combs, you make a blunder. The arrangement that holds the combs while they are revolving should be just as light as is consistent with strength; and I do believe that an expert, with a two-frame extractor, will throw out more honey than an expert with any of the great big heavy machines. There is, of course, a saving of time in having a reversible extractor; but I should have this made just as light as possible; and I would have the combs as near the shaft as possible. Your point in regard to breaking combs because they sink into the wire cloth, I am sure does not apply to any of the extractors we make. If the wire against where the combs rest is of the proper size of mesh, and supported as all of ours are, no such trouble will be experienced. Very thick honey may make it a little more difficult; but we have had no such complaint for a good many years. After the comb has been forced into the wire cloth by turning harder than need be, a reversing device will pull the comb off, perhaps better than you can get it loose by hand. But very heavy combs and very thick honey should be extracted gradually—that is, throw out a part of the honey, then reverse, and finally finish the side you extracted from first. I saw a good many reversible extractors while I was in California, but I do not remember of seeing the device you illustrate. May be I saw it and forgot it, because I examined a great many ingenious devices in a very short time. I think very likely your idea of toothed gearing is as simple as any thing that can be devised. Is it not more trouble, however, to put in and take out the combs with any reversible extractor? Now in regard to the Stanley reversible extractors: I do not believe I found a bee-keeper in any of my travels who is now using one of them. If there is any apiarist among our readers who extracts honey by the ton, year after year, who uses a Stanley extractor, let us hear from him. I do not wish to discourage the use of these—I simply want the facts.

THE GLASS-SNAKE.

HOW IT BREAKS IN TWO.

So many reports in regard to these strange reptiles have come in, that we have not space for them all. We have, however, decided to give place to the following:

Friend Root:—We don't exactly see the connection between "jinted snaix" and queen-bees; but having had some experience with this marvel of nature on the points for which you inquire, we take pleasure in adding our mite to your store of information. It was some years ago, when we were the "boy bee-keeper" of Hawkinsville, Ga., that, while out gunning one morning, we found a snake in the grass (literally) about 18 inches long. We set the gun-stock down on him, and the snake broke in two, thus discovering he was of the much-heard-of jointed kind. We amused ourselves in seeing how badly he could be broken up. We piled the remains on top of a pine stump, and returned to the scene about 10 P. M. We had probably killed him to too dead for a resuscitation. The pieces were all there, but warmth and vitality had fled.

We witnessed one night, only a few weeks ago, from a second-story window, what seemed the rather peculiar antics of a small gray fox that had wandered into the front yard. The animal appeared to be having a lively frolic all to himself in the moonlight. Suddenly he ceased, gazed carefully about him, and then stole quietly away. The next morning, such a snake as Mr. E. McIntyre described on page 777 was found where the sport ended. He was still intact, but his head had been "chawed." Should another specimen fall into our hands we will send it to Prof. Cook, for the tail is not "horny substance," and differs little, apparently, from any other snake's tail, beyond the body proper, except that it breaks readily anywhere the blow falls—at every joint of the vertebra.

We do not agree that the tail is or should of necessity be similar to the rattles of the rattlesnake, or devoid of life in itself, as there is told us of a lizard in portions of Africa and Australia that possesses the property not only of having its tail broken off without injury, but can even discard the same at pleasure when pursued. This tail retains its vitality for some while, and is usually active for several minutes. The pursuer, being attracted by the discarded member, the lizard scampers off and a new tail grows out.

As to the queen and drone of the honey-bees acting similar to Prof. Cook's observations on the bumble bee, we think there can be little question, as the drone must necessarily become powerless after copulation, before the queen finally succeeds in ex-

tricating herself. The drone's weight would then bear the queen down; but if this were not the case, she could not pull loose without some resistance to pull against. This resistance would be afforded by falling with the drone to some surface, and there getting rid of him, after the manner practiced by the bumble bee.

As our bees can fly out almost any time here, we are arranging to make a series of experiments concerning the question as to whether the drones from a mismated queen are the *pure* children of the mother only. We have always been one of the doubters. We will send you the bees if we gather any evidence; at any rate, we will report progress if desired. C. RYAN MITCHAL.

Ocala, Fla., Oct. 7, 1889.

THE JOINT SNAKES MADE OF FLESH AND BLOOD, AND NOT OF A BONY SUBSTANCE.

I read in October GLEANINGS, p. 777, about joint snakes. You said that the part that broke off was a bony substance, without life or motion. Now, I think you are mistaken. I have killed quite a number of them in Iowa; and where they broke in two the body was composed of flesh. They do not unite after being broken; but if only a short piece is broken from the tail, the snake will live minus the piece. If you had been in California during the summer you could have seen "swifts," a small animal much like the lizard. It has four feet, and a long tapering tail. Now, if you should catch him by the tail, or strike the tail with a whip, off it comes, and it will show signs of life by wiggling about for some time. Now, this tail is not bony, but flesh and muscles. F. A. BLISS.

Duarte, Cal., Oct. 11, 1889.

JOINT, OR GRASS SNAKES, A REALITY.

I have seen numbers of them. There is no hard, horny substance about them except the head, and possibly small scales. It may be that they are mostly tail, as is stated by Mr. McIntyre. I can't say; but I do know that they snap in two almost as readily as a glass tube, seeming tougher as they near the head. I have broken them in many pieces, and they remain so until decomposed. They show no blood, as we understand blood, when broken, but I have sometimes noticed a colorless, sticky exudation from the broken parts. The joint, grass, or glass snake, is a reality. I have seen him many times, and he is quite pretty. Ordinarily he would be called a garter snake, but he certainly is not. J. M. SHUCK.

Des Moines, Ia., Oct. 5, 1889.

THE GLASS, OR JOINT SNAKE; HOW IT BREAKS.

Mr. E. McIntyre, in GLEANINGS, page 777, gives a good description of the glass-snake, except the length of the body part and the shape of the break joint. I captured one in Kansas, a few miles southwest of Emporia, and carried it to the house to show to those who had never seen such a snake. There I studied the anatomy of the reptile. It was about 2 feet long, about ¾ tail, which I broke in short pieces, and put them together. The break showed 3 dovetails on each piece—pointed, or miter shaped, as smooth as if done with a carpenter's chisel. The dovetails were about ⅛ of an inch long. I wrote a description, and sent a drawing of the dovetailed or miter break to my sister, Mrs. Laura Henderson, in Pennsylvania. The short miter-shaped muscles were used in propelling the snake, and looked nicer to eat than the interior of an oyster. There was no horny substance except the skin. D. TYRRELL, M. D.

Toulon, Ill., Oct. 7, 1889.

You say you broke the snake apart and put it together again. Now, that is just the point I want to know about. If you put that snake together so he went off alive, tail and all, then I shall say again, that truth is a great deal more wonderful than fiction. I suppose, of course, that this glass-snake does not have a skin as snakes usually do. If so, how can he let his skin tear apart? Of course, you did not make that part "hitch" when you put him together again, did you? Here comes Prof. Cook to our aid:

Dear Friend Root:

I have already anticipated Mr. E. J. Baird's request, and sent an illustrated description of the whip scorpion, or "black grampus." I believe still, that the only harm that this animal can do is by its bite. Is Mr. Baird's account of the anal poisoning and switching any thing more than hearsay?

Now, friend Root, why did you not speak, when here, and I would have shown you those brittle snakes? There are two in our museum—the "blind worm," of Europe, which is really no snake at all, but a legless lizard, and the glass-snake of the South—*Ophisaurus ventralis*, which is also really a legless lizard. When these are alarmed they make their muscles rigid, and this breaks off their tails. All lizards, when caught, are apt to lose their tails in this way. Thus a person who runs a museum of lizards really needs to go into the re*tailing* business. You see, then, that such animals do not break apart—they only lose their tails. I should like very much if some of my Southern friends would send me two or three of these glass-snakes. I will pay for all trouble and expense. I have several fine specimens from readers of GLEANINGS, received of late. I assure you that they are appreciated.

Agricultural College, Mich. A. J. COOK.

Why, friend Cook, I should most assuredly have asked to see the glass-snake had I known you had one in the museum. With the number of testimonies furnished it would seem as though I ought to be satisfied, and yet I am not. The mystery to me is this: Call it a legless lizard, or whatever you choose, these tails are a part of the body, and must grow as the body does. Now, how could they grow without veins and arteries?

Since the above was put in type, we have received the following from Prof. Koons, of the Connecticut Agricultural School. As it corroborates the statements of Prof. Cook, and also gives us some additional very interesting information, we take pleasure in giving it to our readers, as we close the subject, at least for the time being:

Bro. Root:—I have been not a little interested in Mr. B.'s and Mr. McI.'s references to the grass-snake, in GLEANINGS for Oct. 1st. It is not a snake at all, but a retrograde lizard without feet, and is more commonly known as the glass-snake, so called because the vertebræ of the tail are so loosely articulated that they part at the slightest blow. Among scientists it is a well-known object of natural history, called by them *Ophisaurus ventralis*.

It inhabits the warmer parts of America, and is usually regarded as a snake by the masses, because of its general resemblance to that animal; yet on account of its structure it is clearly classified among the lizards. For example, snakes have no true eyelids; but this and other lizards have. Also the skeletel differences about the heads of snakes and lizards are clearly marked; and thus an extended list of characters can be given, which ally it to the lizards, and remove it from among the snakes, notwithstanding its general resemblance to the latter. This glass-snake inhabits the drier localities, where it often burrows in the ground, and is a harmless little creature. Bro. McI.'s discovery, that three or four inches of the head is all the body there is, is explained by the fact that it is a little lizard with a very long tail. There is an erroneous opinion somewhat common, that the pieces of the tail, after being broken off, often join the body again. This false notion is explained by the fact that in this, as in many of the lower forms of animals, lost parts soon grow out again. Starfish furnish frequent illustrations of this quality, as it is a daily occurrence to find them with one arm gone, but a small arm growing out to take the place of the lost member. I have one in my collection that had lost four of the arms, and the one remaining was reproducing the four lost members. The lobster also often furnishes marked illustrations of this ability to reproduce lost parts. A few years since, when engaged with others in marine researches under the auspices of the U. S. Government, we had in an aquarium one day a dilapidated old veteran lobster which looked as though he was the "lone survivor of many deadly conflicts." He had one very small broken leg, one broken claw, one stub of an antenna three-fourths of an inch long, and his tail damaged. Upon shedding his skin, as all crustacea (the lobster and crab group) do periodically, he came out perfectly whole, antenna, claw, leg, and tail, as good as new, and doubtless he was ready for the next "scrimmage" in Lobstertown. PROF. B. F. KOONS.

Storrs, Ct., Oct. 7, 1889.

ALFALFA.

HOW THAT 20,000 LBS. OF HONEY WAS SECURED.

YOU ask me to tell you and the readers of GLEANINGS how I made that 20,000 lbs. of honey from 190 colonies, spring count. I should have made double that amount if it had been a good season, but we have some drawbacks; viz., 1. I moved my bees three miles in March after they had commenced to swarm; 2. When the honey season should have commenced, the army-worm ate all the bloom from the alfalfa as fast as it came, so that the first crop of alfalfa produced no honey, and we had to depend on the wild flowers for our first crop; but the second and third crops were good; the fourth was destroyed by a small grasshopper not much larger than a flea; but he was active, and destroyed the bloom as fast as it appeared; hence there was no honey from this source. The fifth crop is fair, and we are now taking it as fast as we can; and if nothing interferes we shall probably get 100 five-gallon cans more, all from alfalfa. The season has been so poor we have saved only about 85 or 90 swarms from 190 colonies.

Now, friend Root, this honey was all made from alfalfa, and other kindred plants that were dependent upon irrigation for their existence. As before stated, I moved my bees in March, three miles, to a location where they would have 11 ¼ sections of alfalfa within one mile of the apiary; but in one mile another man sat down with 200 colonies, besides several small apiaries of 25 to 30 colonies; 2½ miles north, an apiary of 200 hives; 3 miles N. W., an apiary of 300 colonies, so you see if my bees could have had it all to themselves they would have doubled the yield. Another drawback was that I had an inexperienced man to take care of them on shares. I think if I had had a good man he would have succeeded better, notwithstanding all our drawbacks. Why, it sometimes took him two weeks to go through one time and extract all the honey; and when the honey-flow is good they will fill their hives in five days. One season I extracted every third or fourth day alternately, and they yielded me 485 lbs. to the hive, spring count, and they will do it again when properly cared for. I want a good and experienced bee-keeper to come and take my bees on shares, and by that means it will be very profitable to us both. I hope by this means to succeed in getting a good man to come and go into the business where it pays.

Tempe, Ariz., Sept. 17, 1889. J. L. GREGG.

Your communication is of more value, perhaps, than you are aware of. For years we have been asking for a report in regard to a honey-crop produced entirely from artificial pasturage, or, in other words, we have asked if there was in existence an area of cultivated plants that would furnish stores right through the season, for a whole apiary. Now, your report fills the bill for an apiary of 190 colonies — yes, more too. You say other apiaries also made good results from this one field of artificial pasturage, for, of course, alfalfa was unknown until the country was settled. I am so much interested in your report that I feel a strong inclination to make a trip clear to Arizona to see the thing done. Please tell us if you get large yields of honey every season from alfalfa. If you depend on irrigation, why should it not be a fixed fact every year? It is true, that army-worms and insects may spoil the crop; but when you talk about your *fifth* crop in *a single season* it seems to me you must be pretty near the bee-keeper's paradise. You spoke of an alfalfa field covering 11 ¼-sections—or, if I am correct, 1760 acres. I did not know there were 1760 acres, all in one piece, in honey-bearing plants, on the face of the earth—that is, cultivated acres; and this is not only cultivated, but irrigated. Why did not some one tell me there was such a state of affairs, when I made my recent trip to California? Besides, my youngest brother is near neighbor to you, if I am correct. Now, I wish that both of you would give me a longer letter of particulars. How often is alfalfa irrigated? Do they cover the ground with water as they do in California? What is the land, crop and all, worth per acre? With your warm climate, and no winter, what is to hinder having a steady flow of honey constantly the whole year through? for it would be an easy matter to have the alfalfa come so as to give constant bloom at least one part at a time. Can't you

answer for us that difficult question as to how many acres of honey-plants it takes to keep, say, 100 colonies of bees fairly employed?

BRANTFORD OR BUFFALO—WHICH, FOR THE NEXT N. A. B. K. A.?

DR. MILLER ARGUES IN FAVOR OF BUFFALO.

I HAVE just read what is said in GLEANINGS about the next convention. I am not just sure at this instant what its proper name is, but I am sure it is *not* "International." In spite of any preparations that have been based on its being held at Brantford, I believe that more good than harm would be done by changing to Buffalo. Reasons for this have been already given in GLEANINGS and in the *A. B. J.* Without looking the matter up, I do not know whether it would cost me more or less to go to Buffalo; but I know I would rather pay more, and go to Buffalo. I suspect many others feel the same way, both in Canada and in the U. S. Secretary Holtermann says, "Personally I should prefer Buffalo;" and is it not possible that so many others feel the same way that a larger number from Canada alone would go to Buffalo than to Brantford? It may be said, "Brantford this year, Buffalo next." If the convention is held at Brantford this year, would it be right to hold it 70 miles distant the next year? If it moves only 70 miles per annum, especially when so far to the north, I am afraid it will lose what little right it has to be called any thing but a local society, which right is none too great at best; for, as friend Macpherson says, "It is a well-known fact, that the great bulk of the membership each year comes from the vicinity where the annual meeting is held." So, change from Brantford to Buffalo this year, if enough favor it; but don't talk about holding it a second year within a distance of a hundred miles, unless you want to kill it outright.

Marengo, Ill., Oct. 19, 1889. C. C. MILLER.

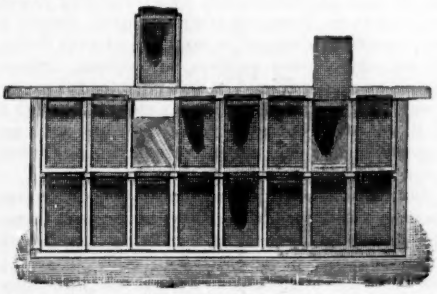
Thanks, doctor, for what you say. I had begun to feel as if I had wasted a good deal of "wind" for nothing, and, besides, had put the Canadians to no little annoyance. If I had not supposed that the *Canadian Bee Journal* had *first* urged such a change, the matter would never have been brought up. I still think that an outside attraction such as the Falls would very materially increase the attendance held at Buffalo. It makes our pocket-books feel a little better if, having invested so much, we can go to a bee-convention, and see one of the wonders of the world at the same time. It is on the principle of killing two birds with one stone. Many of us feel, when bee-journals cover the ground usually traversed at conventions, that it is a good deal to pay out for hand-shaking and apicultural fellowship, much as we value it. But if we can "take in" something else on the same car-fare, this money is gladly paid out. As I said before, I reiterate again: I would a good deal rather attend a national convention with a *large attendance* with some interruptions, than one *poorly attended*, with no interruptions. Still, for all that, I presume Mr. Newman's advice in the *American Bee Journal* of Oct. 16, that the matter be dropped where it is, is wise.

Later.—The last *Canadian Bee Journal* has just come to hand, and I find that it would not be according to the constitution of the society to change at this time. For this and other reasons, it were better that the matter be dismissed at once, and that, in the language of Bro. Newman, we labor faithfully to make the convention at Brantford a successful and interesting occasion. While I regret my action in the matter, I believe that the association will profit materially in the "extra advertising." It was with the best of intentions toward the Canadians that I proposed, or rather, as I thought, *seconded* the change to Buffalo. I did not for one moment doubt their interest in the association or their ability to give a right royal reception to the bee-keepers of the United States. If I carelessly interpreted Macpherson's original editorial, which perhaps I did, I beg pardon. I think too much of the rosy-faced, robust, large-hearted Canucks to merit their ill will. ERNEST.

MANUM'S NURSERY, OR QUEEN-HATCHERY.

FURTHER EXPLANATION, WITH AN ILLUSTRATION.

THE engraving of my little queen-cell protector that appears in GLEANINGS, Aug. 1, page 629, has caused so many to write me, asking all about it — its size, cost, usefulness, whether a success, where it can be obtained, etc., besides the many samples called for—that I have thought best to give the readers of GLEANINGS a full description of the cage and nursery as I use it, that every one may make his own if he wishes.



MANUM'S QUEEN-NURSERIES READY FOR HIVE.

The accompanying cut of nursery will perhaps explain itself better than words from me. I use a half-depth frame for convenience. It will be seen that this frame holds 16 cages. A full-size Simplicity frame will hold 36 cages by having them made ⅛ shorter than those I use; but I should prefer to cut the frame down, and have only 2 rows, or 24 cages, as I find it convenient to have one nursery to contain cells of a certain stage of advancement, and another with cells of another age; and as I breed from queens in different apiaries, I like to have each set of cells in a nursery by themselves; hence I have a number of these nurseries in use.

THE CAGE, OR PROTECTOR.

This is a simple wooden box that I have made for this purpose. It is 2¼ inches long by 1⅛ wide, by 1 inch deep, outside measure. The top end of the box is ⅛ narrower than the bottom, to allow the

wire-cloth cover—or slide—to slide into the grooves made in the edges of the side pieces. I have thought of making them with wire-cloth bottom—or back—but I hardly think it necessary, the box being stronger as it is. The slide is made of wire cloth cut a little wider and longer than the size of the box. A piece of tin, the proper size, is used as a form to turn the edges of the cloth, that it may slide in the grooves easier than the raw edge would; and, besides, the slides keep their shape better by having folded edges.

The hooks which hold the cells in place are made by cutting tin points from a strip of tin ⅝ wide. A representation of these points may be seen in GLEANINGS for Aug. 1, page 629. With the point of a pocket-knife, an incision is made in the center of the top end, and the tin point is driven through into the box, and the point bent up to form a hook on which the queen-cell is hung by the upper end of the cell; then the wire-cloth cover is slid in place, and the cage is ready for the nursery.

These cages, or protectors, can be furnished for 5 cts. each by mail; or just the bare box can be furnished by express at $2.00 per 100. Possibly Mr. Root can furnish them cheaper.

THE NURSERY, OR FRAME.

This is an ordinary brood-frame, with end-bars cut shorter, so that two rows of boxes and center-bar will just fill the space; hence the end-bars should be 4¾ long, as the center-bar is ⅛ thick. This center-bar is kept in place by fitting it into grooves made in the end-bars—see engraving. For a back to this frame, an ordinary tin separator may be used. I use a wooden separator, as I have no tin ones. I use the nursery something after the Doolittle plan, though I place them not only in upper stories, but in any hive or nucleus I wish to, whether they have a laying queen or not. I find that the bees will not always feed the young virgin queens in these nurseries after the honey season is past; hence they should be watched at such times, and fed or removed as soon as hatched. I have hatched queens over and in full colonies for several years, and supposed everybody else did, though I did it on a different plan from this; but this arrangement suits me much better than any thing I ever tried before.

I find that queen-excluding honey-boards are unnecessary for this work, as I have never used them, either for hatching queens or having queen-cells completed after being started in other hives. I have never had such cells torn down, nor have they ever, to my knowledge, caused a swarm to issue.

All honor to our good friend G. M. Doolittle for the many good points he has given us in queen-rearing, though I have never seen his new book.

Bristol, Vt., Aug. 21, 1889. A. E. MANUM.

BEES, BEANS, ETC.

WHY THOSE BEANS DID NOT COME UP.

I SUPPOSE the beans you spoke of several times, as not doing well, did not grow because they had never thoroughly ripened. I remember when I was a boy my father always grew beans for feed for horses and hogs. Those intended for the horses were always kiln-dried, if not harvested well, or not quite dry; damp new beans being very injurious to horses. One time, in planting for the next crop we ran short of seed. After a good deal of argument, pro and con, the last three-fourths of an acre was planted with kiln-dried beans. These last were up first, produced the best crop, and were three weeks ahead of the others at harvest. Does not that look as if a seed must be dry, to be ripe?

THE CLOVER BLOAT.

I remember my father having a lot of cows blown with clover, though there was a man put to watch them. That was in the early part of the fifties—about 1854, I think. What impressed it on my mind was, they got them all into the barnyard as quickly as possible, and tied sticks in their mouths to keep them open, and all so treated recovered but one cow. She would not be caught, and was driven into the barn. The floor was paved with blue bricks, and was very slippery; and in trying to avoid being caught, the cow slipped down and burst.

SPEED OF BEES; AN INTERESTING CASE.

With regard to the speed of bees in flight: Some years ago, in England, I was out on an engine, that we had rebuilt, during her trial trip. A bumble-bee took a fancy to investigate us, and after looking us over on all sides it commenced making a circle around the smokestack, varying from one foot to three feet from it. He seemed to do it with the greatest ease, for several minutes, and then left us, to find himself six or eight miles from where he first joined us. We were going close on to sixty miles an hour. How fast was the bee going, when circling around the smoke-stack?

TO GET WAX OFF FROM UTENSILS.

The best way I know to get wax off from any kind of vessel is to warm them so as to soften the wax a little, then get some clean sawdust, and a coarse rag, and it's just fun to get it off. A teaspoonful each of soot and lime will be plenty to test for ammonia. GEO. E. HAILES.

Lytle, Tex., Sept. 20, 1889.

Friend H., you have given us several things of a great deal of value. The result of that experiment with the beans corroborates exactly the experiment I gave, of planting beans just as soon as they were of full size, but not dry. Now, is there not here a point for our experiment stations to settle? Will our good friend W. J. Green please tell us whether garden seeds are all of them better to be kiln-dried? Since you suggest it, friend H., I recall quite a number of instances that seemed to indicate that seeds must be thoroughly dried, as well as thoroughly ripened. Our garden seeds are in a room warmed by steam, and so near one of the radiators that I have sometimes feared they would get so exceedingly dry it might be hard to moisten them up quick enough to have them start real early in the spring. Your fact, however, indicates that they are just right as they are.—I am glad to have you corroborate the remedy recently given for clover bloat.—If a bumble-bee flies considerably more than a mile a minute, how fast may a honey-bee go if it tries? Surely it can get ahead of its big country cousin.—If lime causes soot to give off ammonia, then soot *is*, without question, valuable for manure. I know it has been many times recommended, but I was slow to accept it, because I could not see any reason why. Will friend Green also tell what he knows about the value of soot as a manure?

APHIDÆ—EGGS AND NO EGGS.

ARE THERE ANY INSECTS WHICH REPRODUCE THEIR SPECIES WITHOUT EGGS?

IN GLEANINGS of April 1st, page 265, Prof. COOK has a short article on house-flies. In it he says: "House flies do not breed in winter, and all insects come from eggs." And, again, at the close of the article he reiterates the latter statement: "All insects come from eggs," and adds: "Any observations that seem to contradict these statements need to be repeated."

I agree with him in regard to what he says about house-flies; but when he says that "*all insects come from eggs*" it seems to me that that statement is a little "too sweeping." I always had the idea that they all came from eggs, until within the last year or two, when my own personal observation forced me to come to the conclusion that there must be some exceptions to that rule. In studying the subject to find out what others thought, I found some items which I think might prove as interesting to others as they have to me.

Here is an extract from Zell's Cyclopedia, in regard to the particular family of insects which I was studying.

APHIDÆ.

A family of hemipterous insects which have the body short, and furnished at the hind extremity with two little tubes, or pores, from which exude minute drops of a very sweet fluid, called honey-dew, which is eagerly sought after by ants. The genus *Aphis*, or plant-lice, inhabit all kinds of plants, the leaves and softer portions being often completely covered with them. The *Aphis humuli*, or *hop-fly*, is in some years very destructive to the crop; and it is to this cause that the variations of the hop-crop, from year to year, are mainly due. The young are hatched in the spring, and soon come to maturity; and, what is remarkable, the whole brood consists of wingless females; and, what is still more remarkable, these females bring forth living young, each female producing 15 or 20 in a day. These young are also wingless females, and at maturity bring forth living young, which are also all wingless females; and in this way brood after brood is produced, even to the 14th generation, in a single season, and this without the appearance of a male. But the last brood in autumn contains both males and females, which at length have wings, pair, stock the plants with eggs, and then perish. Reaumur has proved that a single aphis, in five generations, may become the primogenitor of about *six thousand millions of descendants*."

Reaumur was a French philosopher, a member of the Academy of Sciences, a distinguished inventor, and the author of "Memoirs Illustrating the History of Insects." He died in 1757. According to this account of the aphis, these insects are produced from eggs, and also produce *young in a living state;* the latter more than the former, and in multitudes. Those of us who have plants, and know from personal experience what a pest these "little varmints" are; how rapidly they increase, and how almost impossible it is to get rid of them, are quite willing to believe that they do not wait to be hatched, but come in battalions, ready for work. You can take a clean plant, one that you know is not infested, and place half a dozen of these wingless females on it; then set it away where it will not come in contact with other plants, and do not disturb it for a few days. If you examine it in two or three days I think you will be surprised at the swarms of aphis, of various sizes, which you will find. If you have the same experience we have had, you will find them ranging in size from the smallest specimen imaginable, up to those fully grown. Look at your plant daily, and you will find young insects the first day, and every day.

Ipava, Ill. ANNA B. QUILLIN.

The above was sent to Prof. Cook, who replies as follows:

ALL INSECTS COME FROM EGGS.

I have read Miss A. B. Quillin's interesting communication, with no small interest. The facts which she gives are indeed facts, but they do not warrant her conclusions, as I will show. It will be profitable right here to describe not only the three kinds of sexual reproduction, but also the three kinds of reproduction.

The first kind of reproduction, called reproduction by fission, is simply division. The animal breaks apart, and, presto! there are two animals in lieu of one. This is the only reproduction in the lowest branch of animals, like the curious amœba—the one-celled animals, or the protozoa. Reproduction by fission is also confined to the lower branches of the animal kingdom, though in all but the protozoa it is attended with other kinds or modes of increase. Thus, the beautiful fresh-water hydra, though it reproduces by both the other styles of reproduction, yet if, even by accident, it be cut in two, or even sliced up, each part becomes a perfect animal.

The second kind of reproduction is by gemmation, or budding. A bud develops on the side of the animal, finally drops off, and there is a second animal. Gemmation is also confined to the lower branches of animals. It is well illustrated in coral animals, or polyps. It is always attended with sexual reproduction, and sometimes with fission.

Sexual reproduction is reproduction from eggs. Sometimes these eggs develop with no outside vivifying influence. This is parthenogenesis, or agamic reproduction — reproduction without males. Usually the eggs must receive sperm-cells—must be impregnated, or they come to naught. The eggs are produced in special organs—ovaries—and the sperm-cells in other special organs known as testes. In some cases these two kinds of organs exist in the same animal, and we call such an animal monœcious, or a hermaphrodite. Usually—always among insects and vertebrates—the sex organs are in distinct individuals, and we call such animals bisexual, or diœcious. Even animals as high as snails and angleworms are hermaphrodites. Often the highest animals like some insects appear to be both male and female. This, however, is only superficial. The animal is really either male or female.

Now, while all higher life, even to man, comes from eggs, this appears not to be the case; and it is not strange that our good friend thought I had overstated the matter. There are three kinds of sexual animals. First, the oviparous. These animals lay eggs which develop outside the mother animal, from nutriment contained mainly in the egg substance. Most insects, fish, reptiles, and all birds, are oviparous.

Second, the ovoviviparous. These animals differ from the oviparous only in that the eggs hatch inside the mother, and so the young are brought forth alive, and not as eggs. The nutriment, as before, comes from the substance stored in the egg. Here we find the plant-lice referred to, which are also agamic, the sheep ticks, several two winged flies, sharks, and some snakes.

Lastly we have viviparous animals, which include man and nearly all mammals—there are two

exceptions among Australian mammals. These two are oviparous. In these animals the eggs hatch within the mother, and furnish but a very small part of the nourishment for the embryo, or prenatal animal. In this case a curious and very vascular organ brings the blood of the mother and fœtus, or yet unborn, in close contact, and thus the fœtus gets blood, oxygen, and whatever is necessary to its growth and development. Thus we can say in truth that all insects, vertebrates, and many other animals, come from eggs. A. J. COOK.

Agricultural College, Mich.

My good friends, I am exceedingly obliged to both of you. Our good friend Anna Quillin explains what I have alluded to on another page in regard to the green fly; but I confess that I was never aware that they multiplied at such an enormous rate. Why, it is almost fearful to contemplate. Your explanation gives us a glimpse of the wonderful intricacy and complexity of your chosen line of work—entomology. If I ever had an inclination to think that I knew pretty much all there is to be known in that branch of science, your answer has thoroughly cured me, and it makes me feel like taking a very low and humble seat while I repeat the words of the Psalmist. "How manifold are thy works, O Lord! in wisdom hast thou made them all."

THE COST OF MOVING BEES.

THE RAMBLER REPLIES TO DOOLITTLE, ON PAGE 666.

THE Rambler read Bro. Doolittle's article in GLEANINGS for Aug. 15, p. 666, on the cost of moving bees, and was placidly happy to see Dr. Mason get punched in such fine style. "Why, yes," said we; "what a preposterous idea for a doctor to advance!" No wonder he is baldheaded. We wonder if he runs loose, and boards in a schoolhouse, as the boys say. Well, we smiled along down the column until the Rambler was hit. We "riz right up," shook our fist in the air, and, said we, "It's an outrageous imputation. We never said we could prepare a swarm, load it, go five miles, unload, unprepare it, all in four minutes. What does Doolittle take us for—a telegraph, a telephone, or a streak of greased lightning?"

After this effervescence we calmed down, and finally grasped the situation. We immediately leaned back in our chair, put our feet on top of the bureau, and went into a clairvoyant condition, and saw Bro. D. prepare a swarm for moving. First he got a milking-stool and calmly sat down by the side of a bee-hive; then that little ornamental pile of stones was carefully laid on a newspaper (wonder if he keeps them varnished); shade-board, cover, quilt, and several other fixings were also carefully removed; then each frame secured, ventilation provided, entrance closed, etc., then the milking-stool and man were transferred to the next hive for another half-hours' work, 25 cts. an hour. No, sir, we wouldn't work that way for $1.00 an hour. If we 'ld our hair would all come out, and we should be as baldheaded as Dr. Mason.

Now, to get a colony ready real quick, use a closed-end frame. The Rambler uses such a hive. It is provided with a stand that can be used as a ventilating-rim for wintering or moving bees. Put on the veil, take a smoker, an extra bottom-board and rim, approach the hive, lay the bottom-board on the ground, upper side down, place the rim upon it. This closes the entrance. Place the hive carefully upon the rim; pass a strong cord—several having previously been tied in the form of a loop—around the hive; take a few twists in it, with a stout stick, and the job is done, and quicker than we have been writing it. We then take up the bottom-board and rim that have just been vacated, and proceed to the next hive. We can fix a hive in this way in the spring in two minutes; but if prepared in the swarming season it would take longer; but even then the work could be so systematized as to be done rapidly.

Now, in answer to Bro. D.'s 25-cent-per-hour query, I would say yes. I will work for 25 cents per hour in any bee-yard in the country, for one, two, or three months; 25 cents per hour for each day of 10 hours means $65 per month. But the bee-keeper making a specialty of the business must reckon his pay so as to cover the entire year. At 25 cents per hour it would amount to nearly $800. Now, I wish to ask how many bee-keepers having 200 colonies, and making a specialty of honey production, have, during the past five years, averaged $800 per year.

The Rambler's experience has been somewhat varied. One year in the five has been an $800 year, while the rest have been nearer $200; the average has been nearly $400, or 12½ cents per hour.

The study and close attention I have put upon the business has but little bearing upon the wages. My knowledge of bee-literature, anatomy, and botany in all their relations to honey production will not enable me to get a greater yield of honey than is obtained by the illiterate man who has learned to manipulate his colonies to advantage.

We think Bro. D. makes the mistake of ranking bee-keeping as a profession. The professional man knows every morning when the clock strikes the hour for his labors to commence, just the routine to be followed; his pay is assured, so much per year. His study and preparation have been with the knowledge that he is to occupy just such a position all the year round. If the institution fails, he is sure to find a position in another.

If the professional man is a doctor, and he is skillful, he is sure of good paying patients wherever he may locate.

To be ranked as a profession, bee-keeping must get beyond the many uncertainties that surround it; and while I am a bee-keeper, I must be controlled in the matter of wages by the pay I would receive by laboring for those who surround me, and we will guarantee that 75 per cent of the bee-keepers of to-day are drawn from the ranks of the farmers; and should they give up their pursuit, they would drop back into those ranks, accepting the pay of a farm hand, or tilling their own farm, as they might be favored by fortune. Even at present the Rambler knows many bee-keepers who, after the busy season is passed, hire out as farm hands at $1.00 per day, and are glad to do it; and if the seasons continue as they have for the past few years, many not having the education for other pursuits will have to resort to sawing wood, carrying the hod, or feeding pigs.

We think Bro. D. and a few others are putting the business of bee culture upon stilts, too high for it. It will not bear this elevation. The great mass of honey-producers have to work hard for small

pay; and how to lighten the labor and increase the pay is a problem that gives much food for reflection to the RAMBLER.

Good friend Rambler, we might have had an opinion that you were one of the slow and easy sort of people, as ramblers are quite apt to be; but if you can fix a hive in the way you describe, in two minutes, I guess we shall have to give it up. Have you timed yourself by the watch, or do you guess it would be about a couple of minutes? I agree with you in regard to wages. There is another point you have not yet touched upon. Those who get 25 cents an hour are usually located in the city, where expenses are far different from what it costs for board and lodging on a farm. Nowadays one is almost looked down upon if he looks for a hotel where he can get accommodations for only a dollar a day. Now, one who has to pay about a dollar a day for board certainly can not hire out for the wages paid to farm laborers. The average farmer gets board and lodging for perhaps less than 25 cents a day, therefore he can afford to work at a low price. Whenever I get back from one of my trips I always feel an additional degree of satisfaction with both bed and board at home. We have just what we want to eat at home, and a good bed to sleep in. Our meals do not cost 50 cents apiece, nor does a good comfortable bed cost half a dollar, or two dollars or more if you take a Pullman sleeper. Give me a farm or the suburbs of a country town, rather than the city with all its privileges.

EXHIBITING AT FAIRS.

CORNERING UP THOSE WHO PERSIST THAT COMB HONEY IS MANUFACTURED, AND MAKING THEM RECANT.

OUR fair passed off week before last. I was successful in capturing all the premiums pertaining to honey and bee-keepers' supplies, comb and extracted honey, and first and second on display of hives and fixtures. I had the two-story chaff hive; the one-story chaff hive, with the Simplicity top and also without; the Simplicity portico hive with all its combinations; zinc queen-excluders, crates, T supers, etc. But the greatest novelty I had on the fairground was the extractor. It created more queer expressions than all the other stuff I had. Some people would call it a washing-machine; some an ice-cream freezer, others a machine to manufacture artificial honey, and there is just where the fun would come in sometimes. Some would contend that artificial comb honey could be manufactured, and then out would come a pack of the $1000-offer cards. One smart Alec from Iowa, who happened to be at our fair, jumped me heavy. He said there was a man who lived 1½ miles from him who followed it for a living—kept bees, though, but sold hundreds of pounds of manufactured comb honey. I let him go on till he got about to the right place, then I went for him with a vim. I had a good crowd around, and I went for him with cards, etc., till he crawfished clear out. I explained to him, with a sheet of foundation in my hands, how it was made, its uses, etc., till he just confessed that he believed that was the kind of stuff the man in Iowa was making. I have worked off a great prejudice against extracted honey in the last three years, and can sell my crop of it at the price of comb—from 15 to 20 cts. per lb. LEWIS HOCKETT.

Fairmount, Grant Co., Ind., Oct. 3, 1889.

THE WHIP SCORPION.

PROF. COOK TELLS US SOME MORE WONDERFUL THINGS.

A SUBSCRIBER for GLEANINGS, S. C. Corwin, Sara Sota, Fla., sends me a very curious animal which he wishes me to name and describe. This I am glad to do, and to send a good drawing, made by one of my students, Mr. H. E. Weed, as the animal is not only a curiosity in itself, but is very rare in the United States. I believe this one species is all that comes within our limit; and this is found only on our very southern border. It is more common, I think, in Mexico. This is the "whip scorpion," or *Thelyphonus giganteus*. The figure gives half the natural size. The name "whip scorpion" is given because of its long lash-like tail. Its striking resemblance to the true scorpion explains that part of its name. The scientific name, *giganteus*, is easily explained, and is very appropriate. By the eight legs we are sure that this belongs to the sub-class *Arachnoidea*, or spider group. Its jointed abdomen removes it from the true spider order, and also from the mites. Its long maxillæ, or palpi, places it with the harvestmen, false scorpions, and true scorpions, in the order *Pedipalpi*. Translated, this word means foot-like palpi. These palpi are the large organs just in front of the first pair of legs. In the true scorpions and little false scorpions (chelifers) they present claspers, or forceps-like pinchers, at the end. This is true in a less degree in the whip scorpion, as is seen in the figure. These whip scorpions are easily told from true scorpions, as the long lash-like tail takes the place of the horn, or sting, of the true scorpion. Thus these animals are harmless so far as this part of the body is concerned, while the true scorpions can give a poisonous sting, which is often reported fatal to man, though it is probable that this is exaggerated.

The friend who sends this specimen asks if it be true as stated, that the tail can do fatal damage. This is another case like that of the tomato larva, where man's nonsensical fear has lead to gross deception. Neither the lash of this animal nor the horn of the tomato larva is in the least harmful. The long front legs are quite remarkable in the whip scorpion. As will be seen in the figure, these front legs are nearly twice as long as the others. In this group of animals the jaws are called *cheliceræ*. In these, as in true spiders, there is a poison apparatus connected with the *cheliceræ*. As I have

often stated in GLEANINGS, few if any of our northern spiders can injure man by their poisonous bite. I do not know whether the same is true of this animal or not; but I suspect it may be.

Like all of the arachnoids, or spider group, this whip scorpion has only simple eyes. Of these there are eight. Two of the eyes are close together, far in front, while the other six are in groups of three each, further back and close to the side of the *cephalothorax*, as the head-thorax is called. This head-thorax, unlike the abdomen, is not divided into rings, or segments. The harvestmen (grandfather gray-beards) are the only members of this order that are common in our Northern States. These are the little animals with very long legs that always point toward the cows with these legs. This is a veritable truth, as the legs point all ways. There is one family in this order—the *Solifugæ*—which is very predaceous. One species from California, which I have illustrated in my Bee Keeper's Guide, is known to kill bees. This is a species of *Datames*. So far as I know, this is the only species of the order that is specially interesting to bee-keepers, and I doubt if that one is ever numerous enough to do much harm. A. J. COOK.

Agricultural College, Mich., Oct. 7, 1889.

Old friend, it is exceedingly gratifying to me to find that you are read up and posted on all these matters as fast as they come up. Even the glass-snakes, grampuses, and scorpions, have already been investigated by careful, trained, and experienced intellects.

AT THE VERMONT STATE FAIR.

EDUCATING OLD FOGIES IN REGARD TO THE HONEY BUSINESS.

THIS year the Vermont State Fair Association gave a more liberal premium on apiarian products than ever before. This is due to the never-tiring energy of Mr. J. H. Larrabee, secretary of the Vermont Bee-keepers' Association; consequently a larger display of honey, wax, bees, and supplies, was exhibited than I had ever seen at our State Fair; and I must say that the display of honey was an honor to those who made the exhibit.

Mr. R. H. Holmes, president of the State Association of bee-keepers, had a very fine display of both comb and extracted honey. His comb honey in 1-lb. sections was arranged in the form of an American flag, representing Mr. Holmes' Red, White, and Blue apiary. The emblem referred to was some 8 feet long by 4 or 5 wide. The red stripes were strips of wood painted red, placed at a proper distance apart to admit 1-lb. sections, which formed the white stripes; and in the upper corner, sections of honey were inserted in place of stars to represent the thirteen original States. This was fastened to a beautiful white staff, and suspended in the hall, over his large exhibit of comb honey in shipping-crates, extracted honey in various styles and sizes of glass jars and tumblers, beeswax, foundation, bee-hive, etc.

Mr. J. H. Larrabee's display of honey was not surpassed by any, as he had a very large assortment of beautiful comb honey in various sizes and styles of shipping-cases, which were arranged in a very tasty and attractive manner. I have seen a great deal of honey in the past 20 years, but I must say that I had never seen a nicer lot of honey than that which Mr. Larrabee had at our State Fair. He also exhibited a fine lot of extracted honey, together with a Stanley extractor; also smokers, uncapping-knives, etc. Although the above-named articles attracted much attention, nothing seemed to be more attractive, or call out more comments, than did Mr. L.'s observatory hive of bees. I will say nothing about them, further than that they took the premium, although there were other bees on exhibition.

Messrs. Drake & Smith had on exhibition a full line of apiarian supplies, together with a full line of their beautiful mailing sample boxes, which can not be surpassed in beauty or workmanship. These also took the first premium.

The show was a success in every respect, and I am sure that every bee-keeper who visited the fair must have felt proud of the display.

Your correspondent was much amused at the comments of the people as they approached the apiarian department, having been left in charge of Mr. Larrabee's exhibit while he took a stroll about the grounds; and to show you, Mr. Editor, how ignorant some of our Vermont people are (only Vermonters are so, I suppose) about bees and the bee-business I will mention a few comments as I now remember them.

First person:

"What is that in those tumblers, Mr. M.?"

"It is extracted honey."

"Is it pure honey, *are you sure?*" at the same time giving me a peculiar smile, signifying a doubt.

"Yes, I'm sure that it is."

"What is it made of?"

"The bees gathered it from basswood blossoms."

"Did the bees put it in those tumblers?"

"No, they store it in the hive, and we then extract it."

Whereupon the method of extracting was explained to a large crowd that had gathered about us, to the entire satisfaction of the lady, who purchased some of the honey—at a good price.

Second person:

"Is that real bee's honey in those jars and boxes, sir?"

"Yes, it is."

"Well, a friend back here told me to come this way and I would see some of the new style of honey, such as they make of sugar and starch, and I suppose this is it. My husband keeps bees. He has six stands; but I know that *real* honey is not as white as this is; and, besides, I don't see any place where the bees can get in those boxes. We get our honey in the fall, when John kills the bees. We live over in the east part of the State. My husband says there is a man over here in this part somewhere that feeds his bees sugar, and makes lots of honey."

"Do you know the man's name?"

"No, sir, I do not remember."

"Is his name Manum?"

"Oh, yes! that is the name."

"Well, madam, that is my name, and I think I am the man you refer to."

"Well"—with a slight blush on her face—"do you feed sugar?"

"Yes, most certainly I do, in the fall, when the bees are short of honey for winter stores; but *never* for the purpose of having it stored in boxes, as

it would not pay to do so; and, besides, it would not be honey; it would be nothing but sugar."

She then turned to her boy, and said:

"Here, Johnny, come here; here is the great bee-man your father told us about. Have you written a book on bees, sir?"

"No; I never have, nor do I intend to; but here are some I will give you. They are published by men who know all about bees. Here is the *American Bee Journal*, published weekly, and here is GLEANINGS IN BEE CULTURE, published twice a month, and here are also two others, published monthly. You may take them home to your husband."

Third person; looking at a sample of foundation, and remarking to a friend:

"Oh! I know what that is. It is that yellow stuff the bees have on their legs. The bee-men make wax of it, and weave it into this kind of cloth for the new bees."

Fourth person, to a friend:

"Oh! look at the wasps."

"No, Jane, they are flies, and those things are a new kind of fly-trap. Oh, yes! I see now."

"Oh! look at that yellow stuff there. It looks like wax."

"No, Jane, it is soap, made into large cakes to show, and that there is also soap made into thin sheets so we can roll it up with the clothes to boil."

Fifth person, an old farmer:

"Are you the great bee-man? is your name Manum?"

"My name is Manum, and I keep bees."

"Yes; wal, I thought so, seeing all this honey and bees. Wal, I want my boy to learn to keep bees, for I hear you make lots of money with your bees, so I bought the boy a hive of bees last spring, but they have not done well this summer. He has watched them every day, but they don't swarm. That's why he did not come to the fair. He is at home watching the bees. They are all on the outside of the hive. It is so full of honey he says they can't get in, so he tried to put them in an empty hive, but they don't stay there, and they sting him terribly. I hear you charm your bees so they don't sting. Would you mind telling me how you charm them? I want to help the dear boy all I can."

"Yes, sir, I can tell you how I charm mine. I do it with one of these smokers. They are only $1.00 each, and here are some bee-papers. Take them home to the boy, and subscribe for one or more of them, and let the boy study and work at the bees."

Sixth person, a practical bee-keeper:

"How do you do, Mr. Dodge? How are the bees doing with you this fall?"

"Well, Mr. Manum, I hardly know what to say. They are storing lots of honey, but it is dark-looking stuff, and I feel a little suspicious that the bees will not winter well on it. What is your opinion about it?"

"Well, I feel somewhat suspicious myself, and I thought I would extract the stuff from the center combs and feed 10 or 15 lbs. of sugar syrup to each colony, just enough to carry them through the coldest weather; and I did secure extra help last week, and started in with three extractors; but we did not work long before I changed my mind and decided that this business would injure the bees more than the dark honey would; and even if I lose a few colonies by leaving it in, the loss may not be more than the expense of extracting and feeding would be; so I have decided to pack them as they are, and run the risk. I have kept bees nearly 20 years, and never before have they gathered fall honey enough to winter on; hence I have had no experience with it. I have written, and sent samples of this honey to several parties who have had experience in wintering bees on such honey, and they write me that they would not hesitate to winter their bees on it, so I am going to try it, hit or miss."

A. E. MANUM.

Bristol, Vt.

Your decision in regard to running the risk, in your last paragraph, would accord exactly with my experience in this line. When bees have got poor dark honey—even honey-dew—sealed up and stored, just as it is wanted for the bees, I would let it be and take the chances rather than to throw it out and feed something else. If just before they go into winter quarters there is room in the combs where this dark honey has been used up, and we fill that room with sugar syrup, with a good heavy feed, so as to make every thing full all through the hives, it has never, in my experience, done any harm. In fact, I have had reason to think that the extra sugar syrup given them had many times come in so as to save them from the consequences that might ensue from using the poor dark honey just in the depth of winter, when a long cold spell happens to come.

POISONOUS SNAKES AND INSECTS OF THE SOUTH.

SCORPIONS, GRAMPUS, ETC.

IN compliance with the request of friend Walker and yourself (see page 709, Sept. 1st GLEANINGS), I contribute my mite. In regard to snakes, I would say I was born and raised about 50 miles north of New Orleans, La., and have lived here over two years. I have rambled over the woods on foot, both here and in Louisiana a great deal, being very fond of hunting, and I can confidently say I have seen more poisonous snakes in one week in Louisiana than I have seen all together since living in Florida. We have a good many harmless black snakes. I came across only one ground-rattler, and one of the large species, a small one, about 2½ feet long. A neighbor of mine, while out in the woods about a mile, killed a large rattler about 5 feet long. These are the only two I have seen here. I have killed two or three coach-whips here, but not one of them showed "fight." I have killed a few water-moccasins here, but none of them showed fight until wounded. They would all run and try to get away. Large rattlesnakes are said to be quite plentiful down on the islands about 25 or 30 miles below here. A man living here killed one down there that measured nine feet in length, and had 20 rattles on him. As to the "grampus," they are also found on these islands. We have none up here. I have seen one or two dead ones, brought up from there. I inclose you a clipping from the Bartow *Informant*, a paper published something over 100 miles above here.

WANTED—A NAME.

One day last week we were shown an insect peculiar, we believe, to this portion of the country, and which, as far as we can learn, has no scientific name. It is known in Florida as under the various

names of "mule-killer," "scroncher," and "grampus," but is not mentioned in any book of natural history which we have been able to examine. A specimen, sent for name to the proper authorities in Washington, only elicited the names above mentioned. It is an insect about two inches in length, with huge mandibles, resembling those of a lobster, and long, pointed feelers, which might easily be mistaken for a fourth pair of legs. But the business end of the creature is represented by a slender terminal appendage which is held, like that of the scorpion, over the back. The sting from this is most severe, but not, as there seems to be a general impression, fatal. The insects burrow in the ground under rotting logs, and one can not be too careful when obliged to handle such things, lest they become suddenly and most unpleasantly acquainted with it. A specimen can be seen at Look's drug store.

I will make a trip to the islands shortly, and will endeavor to secure specimens of the "grampus" to mail you and Prof. Cook. I will also mail you specimens of the scorpions, a small stinging insect which hurts about as bad as a bee sting. They are found under the bark of dead trees, in lumber-piles, and trash of any kind. They are also very fond of hiding between hive-covers and the enamel cloth. I have been stung by only one. It is amusing to see how the mother carries her young. They all cluster on top of her back, and she carries them around until they are large enough to take care of themselves. I should have said I have killed several of those joint-snakes in Louisiana that would break all to pieces when struck, but I don't remember of ever seeing any blood. I have never seen one here. As to the specimens of snakes, I can not furnish any of them, as I don't like to handle them. YOUNG G. LEE.

Charlotte Harbor, Fla., Sept. 6, 1889.

Thank you, friend Lee. Prof. Cook has told us a little about the grampus in this issue—see pages 849 and 856.

THE VAN DEUSEN METAL CORNER, AGAIN.

DECIDEDLY IN FAVOR OF 1⅜-INCH SPACING.

ON page 513 I stated that I was not fully satisfied in regard to the 1½-inch spacing of the Van Deusen reversible frame. Theoretically it seemed to me that, when such frames were full of brood, there would be a good deal of spare room between the combs, and that, when the bees should begin to use the brood-chamber for a store house, as they are sure to do when honey is coming just a little too fast for brood-rearing, and not quite fast enough to start them in the sections, there would be a broad area of elongated cells in the upper part of the frames that would ultimately cause me trouble. In this instance, practice has fully confirmed the theory. At the first appearance of honey in excess of the daily needs of the bees they proceeded to draw out the upper margins of the combs unless I happened to be on hand to reverse the frames often enough to keep brood constantly near the top-bar. This kind of vigilance may be all very well for the "fussy" bee-man, but it doesn't do for me. If I have to reverse all my frames every three weeks while honey-boards and supers are on, I will either go out of the business or adopt friend Shuck's hive, support it on two forked stakes, and attach a crank to it so that I may turn it over whenever I happen along. The honey-flow in my locality was barely sufficient to send the most energetic colonies into the sections, while the laggards remained below and filled the brood-chambers to their utmost limit, crowding the queen until there remained for her merely an elongated oval in the center of each frame. In the course of time, the honey that had been placed below the brood by reversing was consumed; but the bees refused to cut down the elongated cells to a proper depth for brood-rearing, and they remained empty at a time when I could ill afford to have them so. Combs at the sides of the hive, full of honey from top-bar to bottom, are quite a good deal too thick for brood-combs. Since I use a contracted brood-chamber containing only 800 square inches of comb, I can not afford to have many square inches of elongated cells. It must all be brood-comb, and I see no way to obtain it and keep it so except by crowding the combs close together. One of my correspondents says he works his combs spaced 1¼ from center to center, and meets with no trouble except where there is drone comb. That is a little too close to suit me, but I want to be placed on record as being decidedly opposed to wide spacing. I have in my yard a dozen hives that are 14⅛ inches square, inside. They take a frame 13⅜ inches long and 10 inches deep. Two years ago five or six of these hives were left with nine frames—the rest with ten. This season not one of those nine-frame colonies went into the sections, while every one of the ten-frame colonies made a record in the supers. They were all populous colonies, and I could see no reason why those with nine combs were not in the sections unless it was because they had both store room and loafing room in the brood-chamber.

Aside from this one objection that I have treated thus at length, I think the Van Deusen metal corner beyond criticism. It works as well with an 8 inch frame as with the 7-inch; and when one learns how to handle it there is hardly as much danger of killing bees as with the suspended frame. I will not reiterate its good points, but simply state that, after thorough test, its mechanical workings have met my highest expectations. But its width must be reduced to 1⅜ inches, or I shall have to abandon it, much to my regret.

THE IOWA HONEY CROP; THE NON-READING BEE-KEEPERS CUTTING DOWN PRICES.

So far as I have been able to learn, eastern and southern Iowa has had an unusually heavy crop, while the western part of the State has had a virtual failure of honey, but plenty of increase. Now comes the exasperating part of the story: Iowa could easily have disposed of her entire crop at home at prices ranging from 15 to 20 cents per lb. for comb honey, and extracted at proportionate prices, had not the producers in the eastern part of the State gone daft at the sight of their own very modest crop. They seemed to think that, because they had obtained a little honey, the whole country was deluged with it. We in the west, with our one-fifth yield, were recovering a little of our lost ground by supplying a fair demand at 20 cts., when, without warning, we were flooded with honey that the grocers bought at 8 and 9 cts. per lb.—choice white clover and basswood in 1-lb. sections, all in splendid condition. Every one of these producers might just as well have had 12½ cts. as 9. All that was required was gumption enough to read and digest the reports in the bee-journals and the bulletins of the honey-producers' exchange. I have no sympathy to waste on them, but I greatly regret the shock they have given our market. The Iowa

honey crop is now mainly in the grocery windows, and will be pretty well cleared out by Christmas. After that the bee-men who have held on to what they produced will be sure to reap their reward.

Audubon, Iowa, Oct. 17, 1889. Z. T. HAWK.

Your reasoning is good, and seems to be sound; and if in repeated practical tests it works as it has with you, it will prove a most important matter, especially in the matter of comb honey. I have worked hives with 11 frames instead of 10, in an ordinary Langstroth brood-chamber, 14¼ inches wide. The combs had to be very exact, and those that did not contain brood had to be very thin. I presume likely, however, where we wish to crowd the honey into supers, 11 frames would be too many; therefore a dummy of one or more chaff-cushion division-boards would probably be an advantage.—We have seen something of the cutting-down of prices by the non-reading beekeepers; but I think, friend H., this matter will correct itself in time. People are becoming better and better informed every succeeding year; and our county fairs are a great factor in getting people acquainted, and in getting them posted.

A LETTER FROM CHINA.

BEES UNDER THE PROTECTION OF A CHINESE INN.

FRIEND ROOT:—Last spring, while on a tour with Dr. Whitney, we stopped for dinner at a Chinese inn. On its right-hand side, facing out, was a bedroom, the front of which had sliding boards that came to within about four feet of the ground, thus making, when the boards were taken out, a broad window of the front. Even with the bottom of this window, a wide shelf had been extended out into the street, and the space below it inclosed with boards extending to the ground. Just under the shelf, at the inner corner next to the door of the inn, a stream of bees was pouring out and in from two cracks, one on each side of a board. The outer crack was quite wide; but the inner one, for only an inch or two at the top, was wide enough for bees to crawl through. The bees were all coming out at the wider crack, and, with but few exceptions, going in at the narrower one. I was interested in their docility; for though a number of persons were standing around, and continually getting square across their track, they made no objections. It was a real Chinese scene. The men went their way, the bees their way, each without noticing the other. As in several other cases like this, when I asked how they got the bees, I was told that they had come there of themselves. The query rises in my mind, Are Chinese bees more fond of human dwellings than are other bees? I thought last week I was going to have a swarm come to me like this, but they went to a drygoods box that Mrs. Whitney had set up, instead of coming to a nice Simplicity hive right from the "Home of the Honey-Bees."

POISON OF THE CENTIPEDE, AND THE USE THE CHINESE MAKE OF IT.

The Chinese are no chemists, and don't understand that the fangs of a snake or the nippers of a centipede can secrete poison from blood that contains no poison, and so they use the whole body. There is no reason for thinking that the centipede *taken internally* has any virtue as a medicine. The Chinese think that, because tigers are so fierce and strong, eating their blood will make soldiers tiger-like; and I have several times seen men going about with a tiger's skeleton, peddling the bones by the ounce for a tonic.

ABOUT THOSE WASPS WHICH STUNG THE COOLIES SO UNMERCIFULLY.

As to our letting those poor coolies get stung, the whole thing was so sudden that none of us four, i. e., the Englishman, Scotchman, etc., got our wits together before the coolies were among the hornets. As I ran, I had thought, "How are our chairs to get past this? and won't it make trouble for passers by?" But I supposed that the coolies had seen the whole thing, and did not dream that they would come running after us as they did. I had been in China only a few weeks. When men, not used to bees, are attacked by angry wasps, they are not apt to see what is happening behind them; and when at a safe distance I turned and saw the other three still running, and the coolies rushing up from the other side, it was too late to stop them.

CHINESE SUPERSTITION; A DEMON.

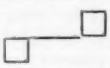
As I was writing on the above, in came the cook, saying, "To-day they say, 'A demon! a demon!' Two of the stone-masons were down at the small river catching the duck that got away this morning, and one of them is drowned." Hurrying to the place, which is nearly half a mile away, I found that the body had not been recovered, and began to strip to swim to the place where the man had disappeared; but the Chinese exclaimed, "There's a demon in there!" All the more, of course, I swam and waded about the place (but I can't dive). The bottom of the stream was full of large angular boulders from the cliffs above. I found nothing, and neither did a boat which soon came up. Fear of the water-demon made the Chinese rather inefficient; but just before dark the body itself drifted down to shallow water and was recovered.

Now, just a few minutes after that man sank, three men on a long narrow raft of small timbers floated slowly past, and were entreated to stop and try to rescue him; but they would not. This was not heartlessness, but superstition—fear of the water-demon, which, they believed, had seized the man; and when that *boat* came, the first thing the man on it did was not to search for the body, but to chase and try to kill the poor duck, the "demon duck" I heard it called, which had been the innocent occasion of the misfortune. Yes, there was a demon there, the demon of superstition. I sometimes say to the Chinese, "You are greatly afraid of demons, and all the time are giving them free access to your hearts."

THE PHILOSOPHY OF THE FLYING OF INSECTS AND BIRDS EXPLAINED.

Why should the flapping up and down of a bird's wings propel it forward? Many of us have seen a boat propelled by working an oar back and forth at the stern, and all our ocean steamers are driven forward by a screw revolving in a plane at right angles with the course of the ship. All three kinds of propulsion—wings, sculling oars, and screw propellers—are different modifications of the same thing, the inclined plane. Did you ever notice one striking thing which characterizes the wings of all flying things, whether bird, bat, or insect—namely, that, while the stems of every thing else in nature are placed centrally, wings are always more or less

one-sided, with the shaft in or near the front edge? As a consequence of this, when the wing descends, the back edge turns up; and as it ascends, the back edge turns down, and thus always presents an inclined plane to the air, which, as it sweeps up and down, propels the bird forward. To illustrate the way the wing works, take a small stick about ten inches long, and slit both ends in the same direction, to the depth of about four inches. Then take two pieces of stiff writing paper, each about 3½ inches square, and fasten one, by one edge in each slit, so that they will project on opposite sides, thus:



Now stick a pin in the center of the stick, perpendicular to the plane of papers, and, taking this between the thumb and finger, hold the toy either face upward or downward, and swing the hand up and down. It will spin around like a windmill, and it will always turn in one direction; i. e., away from the free edges of the papers, no matter in what direction the hand may be swung.

The Chinese at Foochow have a scull for propelling boats, the sides of which are too high for rowing. It is a sweep a little concave on the under side; and near the center, a hollow fits a short round-headed pin, which projects from the edge of the stern, and forms with it a ball-and-socket joint. The scull extends down into the water at an angle of about 45°; a rope is fastened tightly around the upper end, and tied to a hook in the deck below. The boatman grasps the end of the scull with one hand and the rope with the other; and as he pulls and pushes back and forth, the one-sided strain from the hand on the rope turns the blade of the sweep now this way and now that, to the proper angle, as it plays back and forth in the water. It is a wonderfully simple and effective device; and in this matter of making it self-adjusting by applying the force a little to one side instead of directly in the center, it is just like a bird's wing. I have no authority for this theory of a bird's flight except my own observation; and if any one has a better one to propose, I should be glad to hear it.

Shaowu, China, Aug. 12, 1889. J. E. WALKER.

We are much obliged to you for your exceedingly vivid illustration of the effect of superstition. The poor heathen left the drowning man to chase after an innocent duck. Now, the saddest part of it is, that such ignorance and superstition are not altogether confined to heathen lands. A milder type of the same malady exists in almost every neighborhood. Listen to the conversation of ignorant and uneducated people—people who do not read the papers—and you will hear more or less of it.—I am exceedingly obliged to you for your kind explanation of the philosophy of the way in which birds and insects fly; and I confess that the thought never occurred to me before. Why, you have even given us an idea of a windmill that would run in the same direction, whether the wind blowed on the back side or front side, without any vane to turn it around. In regard to insects, I can readily understand from your explanation how the movements of the wings should propel the bird or the insect forward; but I do not exactly understand why it should cause them to rise, unless the head be elevated a little higher than the tail; or if the tail be bent downward at an angle while the wings propel forward, this would cause the body to rise; and I think I now understand why a hawk rises with comparatively slow flapping of its wings. It seems a little funny that I should have to go to China for a scientific answer to so simple a question.

INTRODUCING.

GIVING A QUEEN TO A COLONY AT ONCE.

THE queen arrived all right, and I am very much obliged to you. You sent a small circular with the queen, telling how to introduce her, by the Peet process, to a colony of bees. I have lost queens the very same way you give directions to introduce. I will tell you how I introduce a queen, and I will warrant you will never lose one. I do not make a colony queenless until I get the queen I am going to put in. I take the cover of a Langstroth hive, and set it down on the ground, and put two small blocks under two corners of the cover, to raise it up so the bees can pass under. I then lay a paper down on the ground in front of the cover, and commence to shake the bees off from the frames until I come to the queen. I then cage her, if I want to save her; if not, I pinch her head off and then I keep on until I get all the bees off the ten frames in front of the cover. The bees will run under the cover, and cluster. Take the frames the bees were on, and put them in the hive and put a cloth over them, so the brood won't get chilled; then pick up the cover the bees have clustered under, and give it a hard knock on the ground over the paper. Then take a small sprinkling-can and give them a little sprinkle of water. Open the cage the queen is in, and drop her in the pile of bees. If the bees go to fight her, give them another sprinkle and they will be glad to let her alone. The cover must be set down where you had it before, so the bees can run under and cluster. The bees and queen will be hanging to the inside of the cover. Take the cloth off from your brood-frames; now pick your cover up that the bees are under, and give it a knock over the frames very hard, to knock the bees on the frames; put your enameled cloth on, and cover. Set your hive where it was before, and I will warrant your queen will be laying in a few hours, if she was a laying one at first.

You may think this is a great deal of trouble; but I can do it in three minutes. Is this not better than to wait 48 hours? and even then you may lose your queen; and you will have to wait three days before she commences to lay. I united two colonies together that had good laying queens, and put in that imported one you sent me last Thursday. She is laying, and all right. I have introduced 20 this fall the same way, and have not lost one.

Buffalo, N. Y., Sept. 30, 1889. F. M. JONES.

I hope you will excuse me if I remind you that, although you have introduced 20 queens without loss, you are very likely to have a great many losses with the next 20. The plan you give is old, and has been thoroughly tested. Another thing, it would be nothing strange if nearly all the 20 you mention would have received the queens all right had you just taken out one and put in another. One fall, when we had some queens to destroy, because they were hy-

brid (this was long ago, before there was a market for hybrids), we experimented with them by swapping. We opened two hives at the same time, and traded queens, picking them right off from the combs, and putting the others right in their places. I was greatly astonished to find that the greater part of them went right along to work in the new hives just as well as in their own. This may be astounding to a good many. We tried it in good weather, when the bees were peaceable and quiet. I believe this can be done safely in the majority of cases; and this fact accounts for the great number of processes for introducing queens. The inventor of these processes often feels sure that he has made an important invention, simply because he has introduced a good many queens by his plan and had no trouble. One more instance: Neighbor H. once had a very prolific hybrid queen that he did not value, simply because she was a hybrid; therefore he for quite a time practiced moving her from one hive to another in order to get said hives filled with eggs and brood. He just set her right on the combs without any caging, and she was thus moved from hive to hive for quite a time without injury.

QUEEN AND DRONE IN COPULO.

VALUABLE TESTIMONY BY AN EYE-WITNESS IN THREE CASES.

PROFESSOR COOK asks for further proof that queens while in copulo drag the male bee along the ground. I have been a close observer of the busy bee since I was a boy of 12 years. It is nearly 33 years since I had my first swarm. I have witnessed the mating of but three queens in all that time.

In 1883 I gave a mature queen-cell to a small nucleus of about 100 bees. With so small a nucleus I could more easily see the queen go out and return, and could witness her maneuvers better. On the eighth day after emerging from the cell she came forth arrayed for her wedding-trip, about 4 P. M. She went through the general maneuvers to locate her home, then flew away. I could follow her with the eye for some time, as she hovered over the apiary. In eight minutes she returned without accomplishing her purpose. Next day she came forth at 2 P. M. There were thousands of drones flying at this time. She slowly circled over the apiary a while, about 15 feet high. Three or four drones followed. They finally clinched, and gradually settled to the earth, dropping into a piece of sweet corn in the garden. I was there as soon as they dropped. The queen had clung to a fallen cornstalk, while the drone was trying to get away. They finally separated, the drone dying instantly. I went back to the hive, and in about two minutes the queen returned, with the drone organs attached. The bees on the alighting-board spread their wings in glad delight that she had returned. I gave them two frames of hatching brood, and two quarts of baby bees. In five days I opened the hive to see how they were prospering. The queen's body was distended to an enormous size, but not an egg had she laid. She seemed to try hard. I caught her and held her between some cotton batting, and gently pressed on it. Her lower extremity gradually distended, and I could see a small gummy substance, which I removed very carefully with a pin. In seven days I looked again, and the hive was full of eggs. This was a daughter of the imported queen I bought of A. I. Root the same spring.

The next season, as the prime swarms came off I would take them in three or four days afterward to an out-apiary just four miles away. I noticed where the hives had stood containing the queens of the imported stock. Many bees came back with their legs full of pollen, but no bees from other strains of Italians came back. That convinced me that the newly imported stock was stronger of wing, and had been nearly to my out-apiary after honey before being carried there.

Again, this past season, 1889, I was passing a hive, No. 29, which contained a very prolific queen one year old. What should I discover but two bees slowly settling downward, going over and over? When they got on a level with my face I saw it was a virgin queen and a drone. The queen was trying with all her might to gain the entrance of the hive, and the drone was going the other way with all his might. The queen being the stronger, she drew him down to the alighting-board. She grabbed on with her feet, crawling toward the entrance. They then broke apart, the drone dying instantly. I supposed I had lost my queen in 29; but on opening the hive, not an egg was to be found—all sealed brood. The old queen was there, but her body was uncommonly distended. I caught her and pinched her head, and opened her body. It was filled with a yellowish fluid. She would never have laid any more, as I had kept one several years ago in the same condition. In due time the young queen commenced to do her duty.

Two days before basswood ceased to yield honey, as I was passing a hive I noticed a large bee trying to fly from the alighting-board; but every time she rose two feet in the air, down she came again. It proved to be a virgin queen. Her wings were too short to carry her body. They were perfect in every way, with the exception of being shorter than the wings of a virgin queen usually are. She would get perhaps four feet from the hive, and crawl back into the hive, and immediately come out again and try again to fly away. I watched her maneuvers for two days. I then thought of a plan to have her fly and not get scared by handling. I made a cone of wire screen around the hoe-handle, a foot in length. I plugged up one end, and tied it to the tip end of an 18-foot cane fish-pole. At two o'clock, when thousands of drones were flying, I gently dropped her into the cone and quickly raised it high in air, and kept watch of the tip of the pole. In about two minutes she took wing and slowly circled over the apiary, gradually settling downward. When within nine or ten feet of the ground, several drones rushed after her and clinched and immediately dropped to the ground. I was on hand instantly. The queen and drone were in a seemingly deadly embrace. After two or three minutes they tore asunder, but the drone died instantly. The queen I returned to her hive, and in due time she filled her hive with brood. I had supposed this hive had a fine queen; but on opening it not an egg could be found nor sealed brood; every cell was full of honey. I removed combs of honey and gave empty combs. The old queen must have been gone some time; no knowing how long the

young queen had been trying to take her wedding-trip; but by elevating her in the air she finally succeeded. J. R. REED.

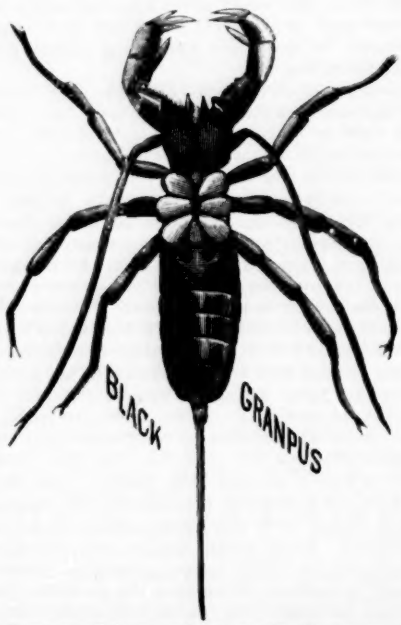
Milford, Wis., Oct. 7, 1889.

You give us some very conclusive facts, and some very *important* facts also. Your last experiment reminds us of the way we fussed with virgin queens at the time when there was such an excitement about artificial fertilization. I have tossed queens up into the air, when their wings were poor, hoping I might be successful, as you were with your fish-pole; but your queen could almost fly, and you gave her such an elevation that it succeeded, I presume by accident. I believe we have had reports before of results strikingly similar, but none quite so direct and positive as those you give.

A FLORIDA BUGBEAR.

POISONOUS INSECTS; BY ONE WHO HAS BEEN AMONG THEM.

THE deadly black grampus, referred to by your West Virginia correspondent in your issue of Sept. 1, page 709, must be a terrible fellow. He is variously called "scorpion," "whip scorpion," and in this region they are called "mule-killers." He is not a handsome beast, and has a bad reputation. Native Floridians, both white and black, generally regard its sting as deadly as the fangs of the rattlesnake.



It has a caudal appendage, needle-like in appearance, about two inches long, that is thought to be its deadly sting. The entire length of a good-sized specimen is about six inches. The palpi, or feelers, are much enlarged by a claw at the extremity, much like that of a crab or lobster. Its color is black. Its abdomen is prominent, like a large spider's, but much longer; and when disturbed or attacked it emits an acrid and offensive odor. It is quite abundant in this region, and I think it is common in all the warmer parts of the State.

It is said to inhabit the southern part of Texas as well as Mexico. Its scientific name is *Thelyphonus giganteus*. It is allied to our common scorpion, *Buthus Carolinianus*, which also has the enlarged feelers and crab-like claws, and probably because of this resemblance it is erroneously called a scorpion. I had been at work upon our homestead several weeks before I saw one. In turning over a rotten log we found him. I was duly warned by my assistant.

"Look out, boss, that varmint 's deathly pizen. They call him mule-killer, but he is a reg'lar man-killer. If he stings you, you die in two hours."

But being of an inquiring turn of mind I decided to investigate the "varmint." I did not at once pick him up in my fingers. He was an ugly-looking customer, and seemed well armed at both ends. Being touched with a small stick, he at once faced the enemy, elevating his feelers and opening his pincer-like claws, ready for battle, at the same time emitting an acrid and offensive odor. I next held him down with the stick, which he tried to grasp with his claws, but made no use of its sting but to keep it in an elevated position. The outcome of the matter was, that the terrible *bear* proved to be a harmless *bug*. The common scorpion is also much of a bugbear, as many believe its sting is fatally poisonous. It has a sting, and uses it at every opportunity; but its sting is less serious than that of a bee or wasp. It is very painful for a few minutes, but does not swell, nor become inflamed.

The grampus is an insect-eater, and a particular enemy of the cockroach, the great pest of the Florida housekeeper, and it should be regarded as a friend rather than an enemy. By this mail I send you a specimen about two-thirds grown. I hope it will reach you safely. Perhaps I should say, I have been in Florida fourteen years, and am very familiar with these insects. I have killed many scorpions, but never a grampus, purposely, until the one I send you. I have often been stung by scorpions, but never could coax a grampus to use its sting. Indeed, the poor fellow doesn't seem to know that he has a sting. When viewed under a microscope of moderate power, the structure of its tail is clearly seen. It is composed of joints, in appearance much like a scouring-rush, and covered with scattering hairs. JAS. H. WHITE.

Island Home, Fla., Sept. 20, 1889.

The above came to us after the article and drawing from friend Cook had been put in type. We are very glad indeed to have a corroboration of the fact that these creatures are innocent and harmless. In fact, the superstition connected with bugs and innocent reptiles reminds us of the demon duck mentioned by our friend J. E. Walker, in his letter from China, in this issue. On our grounds I find it almost impossible to persuade the boys and men that the common streaked snake is not dangerous. Even where they have been found close by a Hubbard squash-vine, doing duty in protecting the squashes, the men can not let them alone. I am quite sure that, if no one would chase them with clubs and stones, I could get them as tame as my Brahma chickens. We can afford to take some space in GLEANINGS to find out that many of God's creatures which have been

pursued for ages as enemies are only harmless friends. Yes, more; that they have been laboring diligently for us for ages past.

FUMIGATING HONEY.

DR. MILLER TELLS WHEN AND HOW TO FUMIGATE WITH BRIMSTONE.

So much has been said lately about brimstoning honey, and the plans in general are so troublesome, I am now tempted to give my way, although I have given it before. It is a very simple matter. Just get some powdered sulphur, light a match and set fire to it, and that's all there is of it. No dipping rags in sulphur, nor any preparation whatever. Within two minutes after the sulphur is brought from the store I can have it slowly blazing away, needing no furthur attention till the last atom is consumed. Although there is scarcely any trouble about this, I take some pains to avoid any danger from fire. Let me give you the minutiæ of my last experience, which does not materially differ from that of several years. We were getting our crop of honey ready for shipment; and trusting somewhat to what I had read of the experience of others, I had said, "This honey has all been taken off so promptly, is so white and nice, and there is not one section in a thousand with a cell of pollen, that I don't believe there is any need of smoking it." But after scraping a good many sections we began to find here and there the tell-tale bits of powder that showed the little worms were at work there, even though we could not see them with the naked eye. So we concluded the remainder must be smoked before any more were packed in cases.

I said to my wife and Emma, "Now don't let me ever again omit fumigating. Those who say there is no need of it have different bees, or something different from mine, and it is just possible that, if they watched the matter closely enough, they would find some of their sections are wormy before they reach the table of the consumer."

So I got a pound of powdered sulphur. The roll brimstone is cheaper, but a great deal more troublesome to burn. The sequel showed that a pound was not enough for so large a room; and, to tell the truth, I don't know what is the right amount. If too much is used, some of the sections are made green; and even with too small an amount used, a few sections were slightly greened. It must make some difference as to the amount of honey in the room. Suppose you have a room measuring ten feet each way, and you find just the right amount to sulphur a single section, will it not require a less amount when you fill the room just as full as you can with sections? When the room is about empty, if it contains 1000 cubic feet of air it may be filled so full of honey that it shall contain less than half the air; and are you not to gauge the needed amount of sulphurous vapor by the volume of air to be saturated? If the honey is smoked within ten days or two weeks after leaving the hives, much less sulphur will answer than a month later. After the worms have attained full size it seems almost impossible to affect them with any amount of sulphur.

But, to return. I have an old kettle, worthless for ordinary purposes, which is placed on a dripping-pan turned upside down. The kettle has a capacity of perhaps 16 quarts, and is filled a quarter to a third full of ashes. On these ashes stands another kettle of much smaller dimensions. In this latter I put the pound of sulphur. Making a kind of little dish in the top of the pile, I stuck in it a lighted match, and at once there was a little melted puddle on which a blue flame was playing. I covered over the whole affair with a worn-out milk-pan, both for greater security against fire, and so that it would burn more slowly. It was placed near a window, so that I could look in and see what was going on. The sulphur was lighted at about six in the evening. At 10 P. M. a line of blue could be seen burning away under the edge of the milk-pan. I then went to sleep and did not look at it again till 12, when it had burned out. Next morning, doors and windows were opened some time before the room was aired out fit to breathe in.

ROBBER-CLOTHS.

Friend Root says he didn't see any robber-cloths when here. No, we didn't need any; and, indeed, robbers troubled very little this year. Still, we did need them later in the season, and they were then used, but not very much. In the revised Langstroth, Dadant & Son include among "the utensils needed for neat extracting on a large scale," "two robber-cloths." Although I believe the robber-cloth is my own invention, I am always glad when it is not needed. C. C. MILLER.

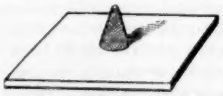
Marengo, Ill.

Well, doctor, if I had found evidences of worms in the sections, as you did, I should, without question, resort to the sulphur fumes; but so many have of late said they did nothing of the kind, and never saw a moth worm anywhere about the whole crop, that I had begun to think it was not necessary; and even now I do not believe I should think of fumigating until I saw some evidences of the moth worm. I would, however, keep an eye on the crop for several weeks after it is taken from the hive.

THE REESE CONE BEE-ESCAPE.

AN IMPROVEMENT.

I AM now using with great success and pleasure my bee-escape made wholly of a flat board and a single cone. The board is just the size to cover the T super or surplus case, and may have bee-space or half bee-space above or below, or both, as needed, and the 2-inch hole is put through the board at such a point that the cone will fit down into the lower or unfinished case of sections. When you have taken one section out temporarily, and this point will be determined by the width of section used, this cone may be about 3½ inches long, and is easily made from a piece of wire cloth 6 inches square, by turning a piece of hard wood to about the shape desired, as a form, and shape the cone over it The cone may be attached to a piece of thin board with a hole in it, instead of the board direct, so the cone may be easily taken off, and all snugly stored away for next season. Now, to take off the last case of sections at the close of the season, just place an empty super over the brood-chamber; lay the escape board on, with cone down, of



REESE'S SIMPLIFIED BEE-ESCAPE.

course, and set the case of honey on top. The few lurking bees that will remain in the top case will all be old ones, and will not show fight when you remove the cover, but will be glad to fly back home.

In this empty case over the brood-chamber, when no honey is coming in between the spring or early summer flow and the fall flow, you will find the bees will cluster very quietly, and be out of mischief. This last plan will not get the bees out quite so clean as the first plan I wrote you about some time ago, but it has the advantage of forcing the bees into the empty case of sections at once, and giving them no empty space to cluster and build comb in the case that would contain the cone. I have been rather persistent in presenting to you and the public this discovery; but I kno v very well its merits, and it is cheap (no patent and no booming). Try them. J. S. Reese.

Winchester, Ky., July 16, 1889.

We are greatly obliged to you indeed for your repeated hints and suggestions in this matter of letting bees go in but not come out, or, vice versa, letting them go out but not come back again. Your arrangement fills the same place in bee culture that a valve does in a pump. It lets the water go one way, but not the other.

ITALIANS BITING THROUGH THE COROLLA-TUBE OF THE TOUCH-ME-NOT.

MORE POSITIVE TESTIMONY OF THE CORRECTNESS OF THE STATEMENT IN THE A B C.

When I first perused the A B C book, I was rather skeptical in respect to the truth of the article where the author describes how he witnessed bees biting through the corolla-tubes of the touch-me-not flowers; and when, at a later time, Prof. Cook said it was all a mistake, and that he could teach another professor that "honey-bees do not bite through the corolla-tubes of flowers" (Gleanings, 1888, p. 926), I was, I am sorry to say, rather pleased to know that A. I. Root was at least once wrong, and not so infallible as I had thought him. But now I am not so ready to believe that he was mistaken after all, as he was to admit that he might be.

This fall I happened to enter a swamp, and I was surprised to find a great number of bees at work on the touch-me-not, which was very abundant. There was not one bee alone, but thousands; and you may imagine with what interest I watched them at work, that I might know the truth for myself. I saw but one bee enter a flower, and I thought he looked a little foolish when he managed to scramble out again, and I did not see him try the same experiment the second time. Almost all the flowers had holes bitten through the corolla-tubes, about $\frac{1}{16}$ of an inch from their ends, and the bees flew to them directly. I had a good view of two or three in the act of biting through the tubes of the younger flowers. There were several small bumble-bees and a few wild bees at work, but they all entered the flowers in the regular manner. These were all the insects I saw at work on the touch-me-not, but I was much interested by seeing a pair of humming-birds, dressed in the brightest of green and bronze, darting from flower to flower, and, passing with rapidly whirring wings, sip with their long tongues the nectar from the deepest depths of the flowers. From what I witnessed, I know of at least one person whom it would be hard to convince that honey-bees do not sometimes bite through flowers to reach the nectar.

In this same swamp there were many thistles—great, lusty, tall flowers, as tall as my head—"bull thistles" we call them, and the Italians were working upon them with a vim. I mention this because I see no mention in the A B C of the thistle as a honey-plant. F. N. Hilton.

Pontiac, Mich., Oct. 12, 1889.

I am very much obliged indeed for the compliment you pay me, and I hope that you and I are correct in the matter—not because I want to get ahead of our good friend Prof. Cook, but because I should be very sorry to know that any statement I have put in the A B C book is a blunder.

PECULIAR HONEY.

IS IT HONEY-DEW, OR WHAT IS IT?

Mr. G. H. Knickerbocker, Pine Plains, N. Y., sends me what he supposes to be "honey-dew." He says his combs are from one third to one-half full of such honey. He desires my opinion as to its fitness for winter stores in this severe climate. He further states, that, were he sure this would be fatal to his bees, he would take them to Florida.

The honey was sent in the comb. It was quite dark, and the taste was so exactly like that of figs, that, had any one put it in my mouth, without my knowledge of its origin, I should have said unhesitatingly that it was figs. Two of my students said the same. One of them said, "It is the most delicious honey that I ever tasted." If this is "honey-dew," it is a very different kind from any that I ever saw or tasted before. As I have written our friend Knickerbocker, I should cast about for some jelly-factory, or other source of fruit-juices, as the source of the nectar from which this honey was derived. I have some very fine fruit honey that tastes very much like quince jam; and this honey made me think of my fruit honey at once.

As to Mr. Knickerbocker's question, let me say that our friend Manum, of Vermont, and several others, have sent me some very pleasant honey, with a like question as to its fitness for winter. All suppose the honey to be honey-dew. My opinion is, that any honey that is agreeable to us, and which we are willing to place on our own tables, is safe for bees. If it is bitter, and unfit for our larder, then it is hazardous to give it to the bees. I have taken as nice honey as I ever saw, from nectar which the bees gathered from the larch plant-louse. Such honey would be ranked No. 1 in any market. I used it very successfully as winter food for our bees. I wish very much to get samples of all such honey. I shall prize greatly some of this from Mr. K. A. J. Cook.

Agricultural College, Mich., Oct. 14.

Friend Cook, I am glad to see you say something favorable in regard to honey-dew. If honey is good, I should eat it without asking why or inquiring w here it came from, providing, of course, it produced no deleterious effect; and I believe the honey-bee has all the apparatus needed to make fit

for human food any thing which they decide is fit to be placed in their hives. Of course, this remark would not include poisonous substances used to kill insects, etc. Whatever nature furnishes, and the bees gather and store in their hives, I think is, as a rule, fit for food. I should be careful about discarding any honey that is nicely ripened and sealed up.

HEADS OF GRAIN

FROM DIFFERENT FIELDS.

AWAY FROM HOME WITHOUT YOUR BIBLE.

I am much interested and refreshed from time to time in reading your pieces for Our Homes, and have been especially struck to-day with what you say on page 751, respecting the difficulty you experienced in getting a Bible. I remember about two or three years ago, when going from home to visit some relatives for a few days, my bag being rather closely packed I omitted taking my Bible, thinking there would be no difficulty in getting three or four if necessary; but to my surprise and grief I found I caused some unpleasantness in getting the loan of one to take to chapel with me on the Sunday morning. It taught me this lesson: Never to leave my own "Sword" at home again, and expect to borrow from others. It reminds me of the ten virgins saying, "Give me of your oil," and getting refused, while we are gone to buy oil (or a Bible). We may lose the opportunity for using it. Better leave our night cap or Sunday bonnet at home than our Bible.

My *other half* is known as "Amateur Expert," so you had better put me down as

Yours sincerely, MRS. A. E.

I am exceedingly obliged to you for your very kind words. The parable you refer to (the ten virgins) surely does seem to hit the point exactly. Since that time, when I have been away from home I have been provided as you suggest.

SUGAR-MILLS IN THE SOUTH.

I have left my little farm, and am at work on the Valley R. R. as lineman. It is funny to see the planters cutting cane in one part of the plantation, and planting it in another. They start to make up the cane this week; from the top of a telegraph pole I can see a dozen or more sugar-mills. An immense old brick mill is going to ruin. The roof had tumbled in on one part. The appliances were behind the times. It has not been used since the war. Although it was Sunday, three men came from the swamp, with a fawn. I have not seen GLEANINGS in three months; but the queen-bee at home reads it. R. R. WILLIAMS.

Baton Rouge, La., Oct. 16, 1889.

MOVING A WHOLE APIARY WITHOUT A SINGLE ACCIDENT.

I moved my whole apiary, of about sixty colonies, without a single accident—not a comb broken down. I moved them on a wagon without springs. I put about 6 or 8 inches of hay in the bottom of the body, and I think it better than springs. I have no fall honey, as we have had too much rain.

J. W. MARTIN.

Greenwood Depot, Va., Oct. 5, 1889.

ANOTHER COLONY OF BEES LIVING AND PROSPERING IN THE OPEN AIR.

I send a rough pencil-drawing of a swarm of bees which I took from the under side of an oak limb about three inches through, where they had begun building their home. The tree stood on my neighbor's place. He found them about two or three weeks before I got them, August 20. They could not have been there long before he found them, for he passed the place nearly every day. They had

A COLONY OF BEES IN THE OPEN AIR.

three cards of comb, about 6 x 9 inches, and a narrow one besides. They had no honey, and not much brood. I think the swarm was small, because there was not much honey to be had at this season. I have heard of such cases in California, but this is the second case I have known of here. I send the drawing, thinking it might be something of a curiosity. It is not a common thing. If any one else has seen the like, I should like to hear about it.

Sarasota, Fla., Aug. 21, 1889. JOSEPH COSTELLO.

THE FOUNTAIN PUMP, AND HOW TO "DOCTOR IT."

My fountain pump does not work very well. It catches, and the pitman will not move readily. Then when it does go it goes with a rush. I have tried to get the thing apart to see what is the trouble with it, but have not succeeded. I want to take it to Cuba with me, to use in swarming time; but I should like to have it work all right. Can you suggest a remedy? A. W. OSBURN.

Pebesa, Cal., Sept. 3, 1889.

P. S.—Hold! Since I wrote the above I have fixed the pump. I took off the nozzle and poured the pump full of castor oil, and now it works like a charm. No charge for this. A. W. O.

The above is an extract from a letter of friend Osburn's. As others may have experienced a similar trouble, we give it to our readers.

NOT YELLOW QUEENS, BUT QUEENS FOR HONEY.

It turns out that the yellow queens that we have been paying such a bountiful price for are only second or third class queens for the production of honey. Well, that is just my experience; and the decision of that question in GLEANINGS will produce a revolution in the queen-business.

La Otto, Ind., Sept. 25, 1889. E. S. HANSON.

We don't deny but there are nice yellow bees that are likewise good honey-gatherers; but the tendency on the part of queen-

breeders has, we fear, of late been to make too much prominence of color, and at the same time sacrifice every thing else for it—real business being a secondary matter.

A COLONY TOO LARGE.

I have a swarm of bees in an eight-frame Simplicity hive. I think the swarm is too large to winter in the lower story. Will it be all right to leave a T-super crate on during winter, nearly half the boxes being capped? I winter in the cellar. I don't care to divide the swarm, as all of my hives are full of bees from top to bottom. This swarm has made three crates of capped honey since August 16, a good per cent of it being from second-crop red clover grown for seed. F. B. DAY.

Pittsburg, Mich., Sept. 17, 1889.

Leaving the sections on top will answer just as well, and, in fact, some years ago a great many reported having had better success in wintering where the sections were left on all winter than where they were taken off. I never saw a swarm too large for wintering, or summering either, in my opinion; but I think I should leave the extra-powerful colony out in the open air, unless, indeed, you have a cellar well ventilated and pretty cool. Be sure they have stores enough. If there is any doubt about it, perhaps another story filled with combs of honey would be safer, especially as your hives are only eight-frame. Of course, it will cost something to winter such a colony; but my experiece has been that, when wintered, they are worth two ordinary colonies, and sometimes even three.

ASTERS.

The aster is just in bloom. It would do you good to see the bees on the flower, and watch their lively movements among the flowers. If it continues as it now is, dry and warm, they certainly will fill up their empty combs, for there is a good part of these combs empty. I have had very little surplus this season. My bees have not stored it. Last fall there was as large a supply of aster as I ever saw; but the weather was so cool and wet that bees actually did not get one good day to work in during the aster season, though they worked some a good many days, but did very little good. DR. W. S. JONES.

Central Station, W. Va., Sept. 15, 1889.

HOW TO FEED POULTRY.

According to my judgment you ought to tell your subscribers that poultry pays if properly managed. Nine-tenths of the drawbacks are due to lice. Why not clean out the poultry-house every week (every day is better)? thoroughly saturate with lime and kerosene oil, and have your houses free from draught and dampness. Save the corn, and feed to some stock that you wish to fatten; feed wheat and oats in the evening; in very cold weather a little is well enough, and mess food in the morning, with a little cotton-seed meal during moulting season. As a rule, the best beefsteak at 16 or 18 cents per lb. is cheaper food than corn at 50 cents a bushel. Procure some good clover hay for your fowls in winter time, for green food; scald it, cut fine and mix with a little wheat bran or middlings. This makes the best morning mess. Have some broken glass or china ware before your hens, as grit; feed regularly; use common sense and prevention, and I can honestly say you can make poultry pay; and for those that have common flocks, if they procure thoroughbred males every season they can greatly improve their stock.

DO BEES SLEEP?

I never read when and how bees sleep. How is it? Kulpsville, Pa., Sept. 11, 1889. A. H. ANDERS.

So far as I know, bees do not sleep. Will Prof. Cook please tell whether I am right?

MY IDYL.

Each poet sings of his ideal fair,
Her charming ways and beauty rare,
All vieing with their utmost zest,
To make their own appear the best.
But *I've* a beauty in my mind
I'm sure outrivals all her kind.
Her form, her face, her very air,
Her — my pen can not describe her hair.
Ah! though I prove inadequate
Upon her beauty to dilate,
All who see her must agree
That she's as "sweet as sweet can be."
And when I note the fair address
Of this great treasure I possess,
Perhaps my actions do imply
That I am badly "gone" on her.
But though I'm voted quite a bore
For boasting her that I adore,
I hope that all will quite excuse
Each silly adjective I use;
For, though to beat, one oft contrives,
She's the fairest queen in all *my* hives.

J. H. MARKLEY.

Carbondale, Kan., Sept. 9, 1889.

GETTING THE BEES OUT OF THE SECTIONS WITHOUT A BEE-ESCAPE, SHAKING OR SMOKING.

In a late issue of GLEANINGS I read your foot-note to an article commendatory of the Reese bee-escape. I have not had experience with the Reese implement, but I have experienced trouble in getting rid of bees in supers when removed from off the hives. This season I discovered how it can be done skillfully, and no trouble. Just as the shades of night appeared, I removed three supers, tiered one above the other from a hive, and set them near the entrance of another hive. Each super contained 28 one-pound sections, which were filled with honey; and when I removed them (the three had been tiered up by placing the second on top of the first and the third on top of the second) I set the load down where I stood, and allowed it to remain there until I was ready and had assistance. When I went to remove the supers I discovered the bees running in a mass from the bottom of the removed supers into the hive close by. I then loosened the supers from each other, and so placed each one in front of the hive that they could run into the hive; and by smoking the bees in the supers they all went into the hive.

Since the experience related, I have practiced removing supers in the early evening, and setting them down until the bees have time to realize they should and do prepare for an emergency by filling themselves with honey. I then place the supers in front of the hive, so situated that the bees can readily go from the super into the entrance of the hive; smoke the bees till most have left the sections, and let the super remain until about daylight, when all or very nearly all the bees have found their way into the hive. I have removed supers from the hive, set them in front of another

colony, and the bees went from the sections into the stronger hive. Why I did so was because I wanted to strengthen the colony. I do not dread removing sections from hives. Try my way of separating bees from filled sections. C. J. ROBINSON.

Richfield, N. Y., Sept. 20, 1889.

I believe, friend R., that all you mention has been many times mentioned in our journals, and the plan of setting the super near the entrance over night is in common use, at least to a considerable extent. But your idea of strengthening weak colonies with bees from sections of honey is, so far as I recollect, new. Although we are not so likely to have weak colonies when we are taking off section honey, it sometimes happens that we want to strengthen nuclei; and bees coming into the hive or nucleus from a crate of section honey would be pretty sure to be well received.

JAPANESE BUCKWHEAT IN FLORIDA.

The Japanese buckwheat I got from you last April gave me such satisfaction that I should like now to get some cabbage seed for winter growing here. We are now sowing the seeds for our winter vegetables. I have the fourth crop from the buckwheat got in April, now in bloom. It has planted fully an acre the fourth time. It has done remarkably well, and every one who sees it admires it, as it is quite a new thing in this section.

C. K. MACQUANIE.

De Funiak Springs, Fla., Sept. 29, 1889.

DOES COPULATION OF BEES TAKE PLACE IN THE AIR OR ON THE GROUND?

GLEANINGS for Oct. is at hand. I see that Prof. Cook has some doubts in regard to the bumble-bees mating when they were on the ground, instead of mating while in the air. I am positive that copulation had not taken place when I first saw them, and that it was accomplished while on the ground. If the queen bumble-bee can not sustain the weight of the drone while on the wing, it is quite certain that the queens of our honey-bees can not, as the drone bumble-bee is considerably smaller than the queen, while the drones of our honey-bees are as large, or larger, than the queens.

C. M. WOOLVER.

Richfield Spa, N. Y., Oct. 7, 1889.

THE BOY BEE-KEEPER AND THE CHURCH HIVE.

These labels are for my little 12-year-old boy, who has an apiary of 14 swarms of bees of his own. They are kept by his uncle, M. M. Rice (the man who took you down to Mr. Dexter's, in his buggy, when you were here). If you remember, when you were at my place you climbed on top of a honey-barrel with your Kodak, and took a view of my apiary; and when you got down you went and pulled some grass away from a church bee-hive (as we call it), to also take that with your Kodak. I told you then it belonged to the boy. I wish he could see the picture of it, as you took it then. He often speaks about it, and asks me to ask you about it when I write. B. E. RICE.

Roscobel, Wis., Sept. 30, 1889.

I remember quite well, friend R., taking a picture of the church hive with the Kodak. I had forgotten, however, that it belonged to the boy. We have the view of the hive; and as it belongs to one of the boy bee-keepers I think we shall have to have a picture made. Tell my young friend to be patient. It will probably make its appearance by and by. I shall always remember you all with a feeling of gratitude for making my short visit so pleasant—especially M. M. Rice, who so kindly placed his horses and buggy at my disposal, that I might make the most of the half-hour I had to stay.

WHAT MAKES THE BEES DIE?

This is the third September I have been here, and our bees begin dying about Sept. 10th, but from what cause I can't tell. I asked, a year ago, one of our best bee-men. He told me it was only the old bees dying; but I can't see it so, as I find about as many young bees as old ones. They act as if they were stung. Last September my bees were in good condition. There were some eight stories, full of bees. When cold weather came they could cover only four Langstroth frames. At this writing they are dying very fast. I find plenty of sealed and unsealed brood. They now work on steelweed and goldenrod, which yield honey well. Our steelweed is one of the best honey-plants I ever saw. It blooms from September 10th till frost kills it. It takes a hard freeze to kill it. Common frost makes it better for honey. F. H. COWDEN.

Morristown, Tenn., Sept. 22, 1889.

From your description I should infer the trouble was caused by something the bees had got hold of. Is it not possible that Paris green or London purple has been used in some manner, and that you have let your bees get hold of it?

REPORTS ENCOURAGING.

FROM 5 TO 20, AND 1142 LBS. OF COMB HONEY, AND HIVES WELL SUPPLIED FOR WINTER.

I have a very good yield of honey to report. I started with 5 colonies of Italians last spring in Simplicity hives. They have increased to 20 colonies. I have taken off 1142 lbs. of surplus honey, mostly in 1-lb sections, and the hives are all full in the lower stories, with the exception of one.

Earlville, Ill., Oct. 1, 1889. L. A. JUDD.

$1115 AS THE GROSS PROCEEDS FROM THE BEES.

I guess you will have to put me in among the Reports Encouraging. My report for this year is as follows: Commenced with 119 swarms; increased to 158 (should have had more if I had not doubled up). I bought an apiary of 53 swarms, not far from mine, just as they stood, with surplus honey, for $159. Honey was all sold from both yards, amounting to $915. I have sold 50 swarms without the surplus honey, for $200. C. A. SAYRE.

Sargent, Ia., Oct. 16, 1889.

A PREMIUM ON EVERY THING.

We got the premium on all the articles we took to the fair—8 in all—comb honey, extracted honey, best display of honey, honey pickles, honey cake, honey vinegar, Japanese buckwheat, and a fat girl baby. How is that?

REPORT.

My honey crop this season was 1800 lbs. comb in 4¼ sections, and 700 lbs. extracted. It was about all gathered from the 15th of August to the 15th of September, and is of a fine quality, and is selling at

12½ to 15 cts. for comb, and 8 to 9 for extracted. Bees are in good condition for winter.

Harris Station, Ind., Oct. 11, 1889. J. KUNZ.

Now, look here, friend K., it seems to me that a man who has so many premiums, and a fat girl baby besides (that took the premium) ought to be able to tell how many colonies of bees he had when he got 1800 lbs. of comb honey and 700 of extracted. If you had only 10 colonies to begin with, it is a big thing; but if all that honey came from 200 colonies, it was not a very big thing, after all.

OUR QUESTION-BOX,

With Replies from our best Authorities on Bees.

All queries sent in for this department should be briefly stated, and free from any possible ambiguity. The question or questions should be written upon a separate slip of paper, and marked, "For Our Question-Box."

QUESTION 147.—*What is the objection to the use of drone foundation in the sections? Bees always build drone comb if the sections are not filled with foundation.*

I see no objection. MRS. L. HARRISON.

No objection. No, they don't. A. B. MASON.

The honey from workers looks finer, and the expense is about the same. Thus I prefer worker. I have no use for drone foundation. A. J. COOK.

We prefer worker comb, for, if the queen finds her way up to the sections, the workers produced will have a value, while drones are worthless.

DADANT & SON.

Drone comb in the sections induces the queen into the surplus apartment when the amount is limited in the brood-chamber. It does not look as well in section honey. H. R. BOARDMAN.

Queens are much more apt to deposit eggs in it than in worker size. I am inclined to think that it is not usually built as firmly to the sides of the section, and is more easily broken by rough handling. Its general appearance, to me at least, is inferior.

O. O. POPPLETON.

Where a queen-excluding honey-board is not used, the queen is more liable to deposit eggs in sections containing drone comb than in those containing worker. After the sections are finished, those having drone comb in them do not look nearly so nice as do those with worker. G. M. DOOLITTLE.

The objections can not be very great, except that the drone-cells are filled with eggs by the queen, which may be expected if drone-cells are scarce in the brood-chamber. Besides, bees seem to give some preference to worker-cells when honey is coming in. They are generally filled up first.

C. F. MUTH.

I don't know that there is any objection to the use of drone foundation in the sections; but bees do not always build drone comb in sections, if the sections are not filled with foundation. I have in my honey-house to-day as nice sections of all worker comb, as anybody would wish to see, built down from half-inch starters. E. FRANCE.

I am not authority on comb-honey production; but my present convictions are that I should prefer worker foundation, even in the sections. I have noticed that bees when given an equal chance will fill worker comb soonest. Should we use drone comb in sections, it would necessitate having two machines or sets of rollers by those who manufacture foundation. S. I. FREEBORN.

The main objection is the inclination to raise drone brood—a great nuisance where no queen-excluding honey-boards are used. This is entirely obviated by using worker foundation. Another objection that I have is, that honey in drone comb does not look so nice as honey in worker comb, and is less readily sealed by the bees. The latter is especially noticeable when the crop is cut short.

GEO. GRIMM.

The principal objection to drone comb has been from the fact that the securing of all worker comb in the brood-nest by the use of foundation has led the queen to use the drone comb in the sections; but now that the queen can be kept from the sections by perforated metal, we should be more in favor of using drone comb. I have used drone comb with impunity wherever I desired to in my extracting supers, and kept the queen from them with the metal. Great is perforated metal!

RAMBLER.

I know of but one advantage of drone comb in sections, which is, that it takes less wax to contain a given amount of honey, and I think this is overbalanced by the more fragile character of such comb in handling and shipping. Yes, bees fill out vacant places in sections with drone, but not primarily to store honey in, but for the queen to lay in; and I have often seen drone-cells in sections well drawn out, and not a drop of honey in them, while the worker-cells were filled and perhaps sealed. If a queen ever gets up into a super to lay, you will pretty surely find her laying in drone-cells there, and drone foundation in sections might be an inducement for the queen to go up and lay in them. I don't think a section of drone comb looks as well as worker. C. C. MILLER.

In the production of comb honey, properly managed, there is no use for the queen-excluding honey-board; but there would be, if you used drone foundation in the sections unless there were lots of drone comb in the brood-chamber. Again, if you did use a queen-excluding honey-board, every queen in the apiary that could manage to get through the metal perforations would get up above if there were drone comb in the sections. I believe the bees would urge her up there, they knowing that the drone comb was there and there was none below. It is the bees that are boss, not the queen. Most people think worker comb handsomer than drone comb. I do not, but the querist will remember that he is raising honey for most people and not for me. No, we have no use for comb foundation, nor drone comb either, except in stock hives. JAMES HEDDON.

The statement with which this question closes is not true, by a long way. My honey is all built from very narrow starters; and about one-third of it, this year, is of worker-sized cells. I have just been looking over a box of unfinished sections put by for next seasen's use. There were 21 with worker comb, while those with drone comb, counting in with them those that had the two sizes, about half and half, numbered only 26. I can not give any objection drawn from actual practice. A theoretical objection is, that bees seldom incline to build drone

comb much, unless honey is coming in with tolerable rapidity. Some of us have to have our crop gathered while honey is coming in slowly; and if the super were chock full of drone foundation, bees might feel disinclined to go on with it.

E. E. HASTY.

There seems to be a pretty fair agreement in regard to the matter, friends. I believe that Dr. Miller, however, is the first one who suggests that drone comb would be a saving of wax, and suggests one thing that I never thought of before; that is, that honey stored in drone comb is less substantial. It seems a little queer that the queen should go up in the sections because they contained drone comb, when she had never been there at all. Perhaps friend Heddon has the correct explanation in regard to it. I expected, when I first saw the question, that a good many would object to the concluding remark. I presume the writer of the query meant that bees will always build *more or less* drone comb if a foundation of worker comb is not furnished them.

MYSELF AND MY NEIGHBORS.

After this I beheld, and, lo, a great multitude, which no man could number, of all nations, and kindreds, and people, and tongues, stood before the throne, and before the Lamb, clothed with white robes, and palms in their hands.—REV. 7: 9.

A SUNDAY IN CHICAGO.

THE convention mentioned elsewhere adjourned at one o'clock Saturday afternoon. Now, Chicago is a wonderful city. A single street in it, I am told, is 35 miles long, and there is ever and ever so much to be seen in the great city; notwithstanding, when the convention was over I wanted to go home a good deal more than I wanted to see any thing else on the face of the earth. I knew that a train would leave in the evening that would land me within perhaps 20 miles of my home, at about one o'clock Sunday morning; and I even began arguing with myself that it would not be wicked to travel on Sunday before daylight. I did not propose to walk the whole 20 miles; but I figured up that I could telegraph to Ernest to meet me about breakfast time, part way, and I could walk eight miles before breakfast, as I did once before. Ernest would have to get up a little earlier than usual Sunday morning, but we could both be home and still have plenty of time for church. Now, this is just what I longed to do, and found it hard to refrain from doing. But something else said, "No, my child, you have really no right to indulge in such a piece of eccentricity. You have much reason to thank God for the strength he has given you, and for the energy with which you meet difficult tasks when they come. But this is not one of them. Remember the Sabbath day, to keep it holy. By far the better way for you will be to stay in this great city, and inquire, as you have done hundreds of times before, 'Lord, what wilt thou have me to do here *this* beautiful afternoon?'"

I obeyed the voice, but I confess that I did not find much enjoyment in it. I visited a nephew of mine in the suburbs, and together we visited the celebrated town of Pullman, where the palace sleeping-cars are made. The place is something wonderful, surely, but I have not time to describe it now. Saturday evening we attended a meeting of the Y. M. C. A., in Farwell Hall. I was much interested, but no particular blessing came to me there. I had simply the consciousness of doing my duty, but at the same time I was just a little bit homesick. The garden down by the creek, my little spring, the carp-pond, and the vegetables that stand the cold weather, including the strawberries, had more attractions for me than any thing that great city could furnish. I felt glad that God had given me a faculty to enjoy innocent, inexpensive amusements; and I felt glad that I loved the home, and the loved ones God has given me, better than any other home, or the home of anybody else, if you choose.

As usual I was up Sunday morning as soon as there was a glimpse of daylight. The great hotel looked about the same Sunday morning as at other times. In fact, there is hardly any morning, noon, or night, for the electric lights keep it about as light at night as by day, and there are always quite a good many folks around. Even early Sunday morning there are quite a few early risers—newsboys and others, moving about. May be you feel like inquiring whether I succeeded in finding a Bible at the Commercial House in Chicago. I was provided, however, so I did not need to inquire. There is one thing I did like very much. A large plain bulletin-board near the entrance of the hotel told all about the religious meetings, Sunday-schools, prayer-meetings, etc. This bulletin-board is corrected quarterly by the different pastors. From that, and from the daily papers, I learned there were no services of any kind until half-past nine. Long before that time, however, I had read my Bible until I was tired, and felt as if I *must* stir around outdoors. Now, I do not believe the all-wise Father expects me to stay indoors until I get dull and sleepy, even if it is Sunday. In a great city one can not get out at all unless he goes out on the streets. I decided to take a walk and look at the different church buildings, whose spires rose from every quarter of the compass. Many of them had very pretty bulletin-boards near the entrances, giving the hour of service, and extending a cordial invitation to strangers. Pretty soon my eye caught a glimpse of a little girl hurrying along with a book in one hand. Soon another one hurried in the same direction. It reminded me of the time when I was writing the chapter on "bee-hunting," in the A B C book. For weeks and months I roamed the forest at different times, eagerly following every bee I could see on the wing, and scanning trees having any appearance of hollows or openings where the bees might enter. When we saw a bee alight near one of these openings, and creep in, what a shout we set up! Now, I did not set up a shout when I saw these

little girls enter the basement of one of the great churches, but I felt just like it. As I neared the door a couple of boys came along, and they too had books. I asked them if it were Sunday-school where they were going, to which they replied in the affirmative.

"May I go too?"

They stopped, took a better look at me, and replied with smiling faces, "Oh, yes! We should be very glad to have you come with us."

As the door opened, a burst of music from childish voices came out and greeted my ear; and then something seemed to say to me, "Look here, brother Root. You have been saying to yourself that you have not had any thing like a blessing for having decided to remember the Sabbath day to keep it holy. What do you think of that strain of music?"

I did not say any thing out loud, but I said inwardly, "Why, it is just glorious. May the Lord be praised for the discovery I have made of such a Sunday-school, and so early in the morning!"

I think we were a little late, for they were all singing from their books. One of the boys showed me a seat, and another one looked from his book enough to see that I was a stranger, and instantly extended his book to me, with his finger on the place; but before my eyes caught a glimpse of the strange characters on the printed page my ears had told me that the singing was in an unknown tongue. From five hundred to a thousand bright, sweet-looking boys and girls of different ages were gathered in the great basement of that enormous church; and although I could not understand a word of the hymn they were singing, I knew it was praise to God, for the music was one of our most familiar hymns. Of course, I thanked the little friend who brought me the book, but I was obliged to explain to him that I could not read it. He looked up at me with curiosity and surprise, and said, in good English, "Why, can't you read German?" I shook my head, and so he kept his book. Very soon another childish face caught my pleased glance, and he too brought me a book. Then a third one did the same thing, until I began to decide that I should have to take a book and look on, or all the children near me would feel they were lacking in courtesy. My friend, is it a lesson to you as it was to me? Are the children in your Sunday-school, every one of them, taught to hand their book to a stranger as soon as they notice his presence? If not, then I want to tell you that we are, a good many of us, behind. As hymn after hymn was sung (all of them were very familiar tunes), I began to get happier. The children, almost without exception, entered into the spirit of the singing, with a heart and soul I never saw before. It seems to me that the sight of their faces alone, even if I had been totally deaf, would have filled me with thrills of joy. I looked from the pupils to their teachers. Many of the teachers were in their teens; but I tell you they were faithful and honest teachers. The boys in the class near me were restless, and full of pranks, as they are in almost any other Sunday-school, and they made quite a good deal of noise when they were not singing. The youthful teacher remonstrated in German, several times; but it did seem to me as if some good forcible English was what was needed. I was a little startled when he evidently came to the same conclusion, for he spoke out in the clear tones of my mother tongue, "Look here! can't you behave yourselves just a minute or two until school is out?" Some of them looked at me and smiled, thinking that, perhaps, as it was something I could understand, they would have (out of respect to me) to do a little better, and they did.

It was not only the children I loved, but the great tall heavy superintendent. I have often seen German people gesticulate, and, with motions of the body, make clear their meaning; but it has usually been in the neighborhood of a beer-saloon. It never occurred to me before that this same talent for gesticulation could be used in explaining the Scriptures and in glorifying Christ Jesus. I could catch, from the faces of the audience, especially the teachers', the points he made in his remarks and motions; and when they came to repeat the Lord's prayer in concert I was pleased to know that I could keep track pretty fairly. Before the school closed I also caught glimpses here and there of what was being said and talked about. How that big superintendent *did* get around among his teachers and hundreds of pupils! I have seen people take long strides before, but I believe that this man did more work in a few minutes in the line of superintending the Sunday-school than any one I ever before met. Before the school came to its close I made up my mind I would never doubt again, when tempted to run away from the path of duty. Why, I actually began to think that I should find no enjoyment and no blessing at all to compensate me for having resisted the impulse to run home. The thought of that Sunday-school will brighten my whole life; and it is particularly along in the line of our text that I feel such a thrill of pleasure when I think of it. It seems to me that I there beheld the great multitude of which John spoke—a multitude which no man could number; a multitude composed of those who spoke another tongue, and people of another nation. They stood before the throne of God, and they were surely clothed with white robes compared with many of the children of our great cities whom we meet on the streets. I did not understand the language, but I have not a doubt but that it was something akin to "Salvation to our God, which sitteth upon the throne, and unto the Lamb." I love that school because they gathered there so early in the morning; and it gave me a feeling, too, that the other great churches in Chicago were not built entirely for show and effect; that even the basements were being used to glorify the Lamb of God which taketh away the sin of the world.

I have before spoken of the faithfulness and honest sincerity that I have found among many of the German people who come from the "fatherland" to our shores.

My heart has often been touched to see how patiently, and with what fidelity they will stick to their task until it is done *well* and *thoroughly*, and oftentimes in striking contrast to the heedless and slack way in which we Yankees "hustle" things. I had a strong love for the German people before; but as the glimpse of that Sunday-school comes again and again to my memory, and as the snatches of melody from the hymns I heard there sung by many voices come again and again to my ear through memory, I feel a stronger love and a greater desire to grasp these friends from another shore by the hand, and bid them welcome. I like to get hold of the hands of the mothers and of the little children; I like to grasp the stout heavy hands of the fathers—hands that have been made tough and hard by years of toil; and I like to say, "Welcome, dear friends, to these broad lands of ours, offering so many opportunities and privileges to those who love to work." Yes, I love the German people, and I love Chicago too, in a way that I never did before, since staying there through the Sabbath, in obedience, as I believe, to God's holy command. Not only had I found many *neighbors* in Chicago who spoke my own language, but I found neighbors among those who spoke a language I did not understand at all; yes, and neighbors who worshiped God in that to me unknown tongue. I shall be less afraid, I think, should God ever call me to stay there again; for is it not true that all nations and kindreds and tongues and peoples *shall* stand before the throne, clothed in white robes, ... saying, "Salvation to our God, and unto the Lamb"?

THE NORTHWESTERN BEE-KEEPERS' CONVENTION AT CHICAGO.

AN ABBREVIATED REPORT, MOSTLY FROM MEMORY.

IT was my good fortune to be present at the deliberations of the bee-men of the West, on Friday and Saturday, October 11 and 12. Having it come so near the last of the week was, on many accounts, objectionable, but the reasons for doing so were that we might take advantage of the reduced rates offered, especially to those who wished to attend the Chicago exposition. Although reduced rates were announced in the papers, none of the railroad officials this side of Chicago seemed to know any thing about it. I presume it was a mistake, or an omission somewhere; but I think that such mistakes are unfortunate, especially for the railroads, as it encourages people to make unkind remarks in regard to railroads in general—that "they make these offers just to get our money, without any expectation of giving reduced rates at all," and such like expressions. I do not believe this is true; but I think it more likely that it was through somebody's neglect. There is a good deal of machinery connected with our great railroads; and although the work they have accomplished is stupendous, we must still keep in mind that the individual members of these great companies are all human. *Some* of them are dishonest and tricky, it is true; but by far the larger part are only guilty of forgetfulness, procrastination, and neglect, just as you and I are.

The first familiar face I met was our old friend J. A. Green, whose writings have made his name a familiar one. Shortly afterward I met friend Heddon and his son, a nice young man perhaps some younger than Ernest. The president, our good friend Dr. C. C. Miller, came a little later, accompanied by his sister and sister-in-law. Mr. Aspinwall, of potato-planter celebrity, was there with his combs made of wood. He is getting to be quite enthusiastic in bee culture, and it was quite a pleasure to hear him talk.

How early shall we put bees in the cellar? was decided by a vote—the greatest number favoring about Nov. 25. I was a little surprised at this, because I supposed experience of late was in favor of almost one month earlier; and most of the friends present came from a much colder locality than our own.

In regard to the best size of section, the general preference was in favor of the one-pound, or, perhaps a little better still, something a little *less* than a pound. The objection to having them run over a pound was, that consumers usually inquire first the price of honey. If the reply is, "Sixteen cents," and a section is handed out, if it weighs up only 15 or 14 cents, it is all satisfactory. If, however, the dealer explains that, although it is a pound section, it weighs more, and the price is 17 or 18 cents, many feel a little as if there were some kink about it that was not quite straight. Very likely this is true. But our Simplicity section, as a rule, especially where separators are used, runs a little less than a pound, rather than over. Friend Heddon remarked that he sold half-pound sections readily for 10 cents apiece. With us, however, half-pound sections have not been a success. Our customers have become used to a pound, and they do not take readily to something different. Perhaps one reason is, that we have pasteboard boxes made expressly for the one-pound section, and we have not as yet had any made for the half-pound. In regard to supers for comb honey, something like the T super seems to receive the preference. When one has more bees than he wishes, uniting in the *spring*, so as to make colonies extra strong, is recommended. To facilitate the disposing of extra queens, I would suggest timely advertising.

PREVENTION OF SWARMING.

With out-apiaries it is especially desirable to have as little swarming as possible. Our enthusiastic friend Aspinwall thinks he can prevent swarming by the use of his wooden combs. If the bees have no drone comb, and no opportunity of making any, they can not rear drones; and friend Aspinwall says no colony swarms until it has drones or drone brood. I do not remember that this matter has ever come up before in just this way. It has set bee-keepers to thinking, and the matter will be tested pretty thoroughly, doubtless, during the coming season.

UNFINISHED SECTIONS.

The old question that was discussed two years ago was revived. J. A. Green still insists that it does not pay to keep over old sections partly filled with comb; that is, no more than what are needed for bait combs, say one or two in each super, to get the bees to commence readily above. Others insisted that they could get quite a yield of honey by having sections partly or nearly filled with natural comb, where they would get little or none with empty sections, or even with sections having full sheets of foundation. Dr. Miller piles his supers of unfinished sections up, then places them in a hive, in the open air, and contracts the entrance of said hive so that only one bee can get out and in at a time. He says it does not encourage robbing, but, on the contrary, the bees clean out the sections so nicely that there is no more tendency for the honey to candy when placed in these old combs than if put in combs nearly drawn out from fresh foundation. Several recommended breaking down the comb in old sections, so the cells were, say, not over a quarter of an inch deep.

QUEEN-EXCLUDING ZINC.

Quite a discussion was also given in regard to this. I believe the general tendency was, however, greatly in favor of using queen-excluding honey-boards. Some of the zinc used in our early experiments was too large, and some was too small. Very likely there is not a perfect agreement among bee-keepers as to the proper size of perforations. Three different sizes are, I believe, now on the market, varying but a hair's breadth, however.

I was pleased to find one of our commission men, Mr. R. A. Burnett, present at one of the sessions, and he talked to us on

MARKETING HONEY.

He says that honey, as a rule, ships much safer in October and November. When the weather is very warm, there is much greater danger of breaking and leakage. He says the pound section seems to have pretty much driven out all other sizes. For extracted honey, the 60-pound tin can boxed seems to be the best package, and I believe it is also recommended as being the best for storage.

BROAD AND NARROW TOP-BARS TO FRAMES.

There seemed to be a difference of opinion in this matter. While some prefer top-bars 1⅛ inches wide, by far the greater number seemed to prefer them about ⅞. Very likely the wide top-bars might work something as does a honey-board in discouraging brace-combs between sections and the top of the frames, or between the sections and the honey-boards.

OVERSTOCKING.

While without doubt many localities are often overstocked, the general opinion seems to be that we may keep from 75 up to 150 colonies in a single location, rather than to start an out-apiary. Circumstances may, however, modify this a good deal.

For a more complete report of the convention, see the *American Bee Journal* for Oct. 23. In fact, I am indebted to the report there given for bringing to my mind the many points considered.

SPECIAL DEPARTMENT FOR A. I. ROOT, AND HIS FRIENDS WHO LOVE TO RAISE CROPS.

RAISING THINGS UNDER GLASS.

I AM going to give you a talk now, dear friends, on a subject that has been on my mind for several years. In fact, I spend hours and hours in inventing and planning in regard to it. I have enjoyed myself, too, in the work, even though it has not as yet amounted, probably, to very much. Sometimes when I am taking a buggy-ride in the night, or riding on the cars, I say to myself, "Now for a good time inventing, planning, exploring, etc." In the first place, I have never been satisfied in raising lettuce, radishes, strawberries, spinach, corn salad, onions, cucumber, etc., under glass. The reason I have never been satisfied is, that they do not grow and succeed as they do outdoors. In fact, I have never seen many greenhouses in my life where things look as thrifty and healthy as I wish to see them look. Perhaps you think I demand a good deal. Well, may be I do. I should give up discouraged, perhaps, were it not that I have now and then had glimpses that seemed to show the possibilities in the line I am looking into.

Another thing I do not like about plants under glass: It is the almost invariable green-fly accompaniment. Instead of getting the conditions just right for the growth of lettuce, tomato-plants, etc., we seem to almost invariably hit upon the exact conditions required for raising the green-fly. If that were what we set out to do, we might rejoice over our complete success. First you know, here and there will be the little white specks on the ground, indicating their presence. Examination shows just occasionally a green fly. In a week there are hundreds, and in two weeks may be a hundred thousand. If you enjoy seeing growth and multiplication in animated nature, you have it with the green fly, to a dot. Well, why does the green fly grow indoors and not out? I have never yet found anybody who can tell; but I think I have solved the problem myself. Some years ago I speculated a good deal as to why there was not a green fly to be found in the open air, while they were a perfect pest in a bed not one yard distant, under glass.* Perhaps you may ask, "Why not have all the lettuce in the open

* I am aware that we can manage the green fly by the use of tobacco. Last winter one of our boys fumigated the greenhouse so thoroughly that he killed every fly in every stage of existence; but he killed all the tomatoes, radishes, and even injured the lettuce. But I do not like tobacco. I do not want it around our boys, and I do not want to regale the senses of our visitors by something so strikingly like tobacco juice squirted on a hot stove in a poorly ventilated room. Of course, if there is no other way we shall have to use tobacco dust, and tobacco smoke and vapor. But I believe there is a better and cheaper way.

air?" Why, we do do just that until the frost is severe and must have protection. Why not, then, cover it when the frost is severe, and no other time? Well, it is just the thing we are coming to presently but not just yet. The question now is, "Why does not the green fly flourish in the open air?" Well, I think I have solved that problem. At one time, when a bed was badly infested, some time in March, I think, the weather became warm enough so we could strip off the sash, and in a little while the green fly had disappeared, and the lettuce looked strong and healthy. Was it the circulation of air all around the plants, that they did not have under glass? I thought so once, but I afterward gave it up. A long drenching rain was what wound them up; and I feel sure, my friends, that it is the long drenching rains that stop the enormous multiplication of all aphide families. Perhaps you suggest a remedy—watering the plants profusely in the greenhouse. Well, I think this would answer, providing you could imitate a gentle shower, and keep it up for three or four hours. Spattering water upon the ground so as to make the ground muddy may perhaps injure the fly, but it also injures the plants. We have just experimented upon a pretty large scale with greenhouses made so the rain could come through all around the lights of glass; but it came in streams and "lumps," if I may use the expression. It made the ground muddy and soggy, and spattered soil all over the plants, and would not answer at all. So it is with a great part of the watering. Nothing has ever been invented so good as nature; and I propose that nature shall have her own way. Not only is rain better than any other kind of water, but straight sunshine without any glass intervening is better than any kind of sunshine that comes through glass, cloth, or any thing else. Newly transplanted plants, that need shading, of course do not come under this rule. In that case we wish to cut off the rays of the sun, and confine the dampness so that the ground shall neither bake nor dry, and so the plants may not wilt.

Now, then, we know what we want, or at least I think I know what *I* want. I want my whole garden right in the open air, where it can get the first ray of sunlight, without obstruction from trees or buildings, and where it can get the last ray at night in the same way. I want every thing in the open air the way I have described, until the nights get so cool that the plants will receive injury. Lettuce, strawberries, onions, spinach, radishes, and a large class of plants, do not seem to be hurt by nights so cold that the ground freezes so as to make a crust. They will, however, make more rapid growth if protected so that the ground does not freeze at all. If, however, all the crop is ready for the market, and we wish to hold it there in order that it may not shoot up to seed, then leave it out, even though the ground does freeze. Give it protection only when the foliage is liable to be injured. I have ascertained by experiment pretty nearly where this point lies. Even tomato-plants, when hardened by gradual exposure, can be made so tough that they will stand a pretty cold snap. In fact, they do not seem to be very much harmed by a little snowstorm, providing the air is above the freezing-point at the time the snow falls. Cold winds do more damage, even though the temperature of the air is considerably above freezing, than does a light fall of snow without wind; therefore we want to make it a study to know just how much hardening our plants will bear and not sustain positive injury. At the present writing, Oct. 16, our peppers in the open air across the street from where I am writing have sustained no serious injury. Tomato-vines have been killed on the low grounds, and these peppers are scorched a *little*. But under the influence of our Indian summer they have made new growth, and we are having peppers in abundance. They have become gradually hardened, so they would stand a good while, if we could interpose glass or cloth for a few hours during severe weather. There is almost always quite a demand for all these things just after frost has killed them all. Many of our customers complain bitterly almost every year because they were a little too late in getting something they intended to get. Well, how shall we interpose this cloth or glass when it is wanted, and get rid of it quickly and easily as soon as it is wanted no longer? Another thing. I want to have the establishment look tidy. Sunshiny mornings, after the frost has melted away, the sash, cloth frames, sheets, baskets, boxes, newspapers, etc., scattered all about the garden are a nuisance. Besides, the wind gets hold of them, and blows them around in an unsightly way, to say nothing of the damage they do. I know how market-gardeners manage it. I have carefully hunted up all such establishments in the vicinity of many of our great cities. The only plan I have discovered is by means of the usual hot-bed sash. The bed is a little less than 6 feet wide. The sash are mostly more than 6 feet long, therefore a man is needed at each end of the sash to remove or put it back. It is true, a good strong man can handle sash alone to a certain extent; but it is very hard work. When the sash are removed, of course they must be put somewhere; and the customary way is to have beds of such length that the sash may be put in piles at certain intervals. These piles should not rise more than five or six feet, for convenience. Probably not more than 50 sash would be put in a pile; therefore if the sash are three feet wide, the piles would be 150 feet apart; and the men who handle them are obliged to carry the last sash removed, a distance of 75 feet to reach the piles. This makes it so big a job to cover and uncover the plants that the sash are on a good deal of the time when it would be much better to *have them off;* and, vice versa, they are off a good many times when they really should be *on*. My experience with handling sash has been that the plants are either getting scorched by frost or scorched by heat a great part of the time.

A year ago I procured three sets of Hitchings' apparatus for raising and lowering sash. These operate so easily that I oft-

en open them when the sun comes out from between the clouds, and close them again when it goes back under the clouds, and I really enjoy it, for the whole operation consists simply in turning a crank. I do not enjoy lifting sash at all, especially on a windy day; but I think that turning a crank is just fun, especially when I can see a dozen sash move in obedience to my will, and when I can hold them at any point without a bit of danger of the wind taking them from my grasp and doing damage. It takes an expert to handle sash without "putting his foot in it" every now and then; but any cheap boy can turn a crank. Now, I am not a "crank" myself, and have no ambition to be called one; but I do *love* cranks—that is, the kind I have described. I think you now see what I want. I want an arrangement whereby we can get either glass sash or cloth frames entirely out of our way by simply turning a crank, and can also put them back exactly in place, and have them held there safely by *turning* the crank the other way. If you want great power, the crank may be a very long one. In my recent visits to large cities I have been greatly interested in seeing two men, with a crank for each, *ten or twelve feet long*, move a great iron bridge, large enough to permit great vessels to pass through, and strong enough to hold heavy railway trains, after the bridge was back again in place. Yes, I have had visions for more than a year, of a great glass structure to revolve on a central pivot, just like these immense bridges. Half of this structure would be glass, and the other half an opening. One or two men could turn it around so as to present the glass toward the sun as it marched through the heavens; and when the weather is warm enough, the *open* space could be turned toward the sun, so as to get the direct rays; and when it rains, the whole contents of the greenhouse could have the benefit of the shower. If a steam-boiler is used to heat the house, a little engine would do the turning. In fact, a thermometer could be made by electricity to revolve the whole apparatus in obedience to changes of temperature. But I think I should prefer bossing the turning myself.* I have also thought of a greenhouse set on wheels, to run on a railway track. When the sun shines, push it back out of the way; when it gets frosty, shove it forward. As, however, it is risky business to move glass structures, we could, if we choose, have the *plant-beds* on wheels, and run them out for rain and sunshine, running them in again when they need protection.† The great objection to all these arrangements is, that we must have twice as much ground as our garden occupies. In great cities, where market-gardening is mostly carried on, ground is quite expensive; and keeping an extra piece of ground, just for holding a glass house, or plant-beds, occasionally, is quite expensive. We want our glass sash or cloth frames taken away somewhere so as to occupy but little space.

What objection is there, do you ask, to Hitchings' apparatus for tipping the sash up edgewise? Well, in the first place this machinery does not tip the sash up so as to let the rain strike every part of the plant-beds. Perhaps it might be arranged to do this. Another thing, it takes enormous power to raise all the sash in a large greenhouse up on one edge. Do you say, "Balance them by a shaft through the middle, so as to swing them on their centers"? Very good, but still two difficulties present themselves. If we have the glass near the plants (and it is by far the better way), the sash will come down unpleasantly in the way when the weather is warm enough to have every thing open. Another thing: A sash, to swing on its middle, must have a great many openings in the greenhouse—openings of such a character that it is quite difficult to have them closed up tight when zero weather comes.

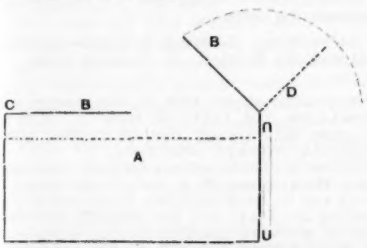
Perhaps I should explain, that, in our locality, there is not a month in the year, and very few *weeks*, when we do not have rain more or less, even in the coldest part of the winter; and when it is warm enough to rain, it is warm enough to have every thing in the open air. I have tested the matter on a small scale, far enough to know that excellent results can be obtained by such a contrivance as I have suggested. In fact, Peter Henderson has figured a house for hardy plants in the florists' line, made a good deal on the plan I suggest. You will find it in the *American Florist* for Aug. 1, 1889. You can easily test the thing on a small scale by making a plant-bed on the south side of some building. If a wing comes out just far enough to keep off west and northwest winds, it will be an advantage. Now have your sash hinged at the north side of your bed, so that it may be turned over against the wall of the building, and you have it. Even if your bed is 30 feet long, a man at each end and one in the middle would throw the sash over against the building, where it must be fastened, of course, to pre-

*This great circular glass house should have the lower edge of galvanized iron; and this lower edge, where it revolves, should dip in a trough of water. This would make it turn with great ease, and yet be perfectly air-tight. When the water in the trough freezes up, there would be no need of turning it; and the metal edge frozen fast in the trough of water would make about as tight a joint as one could ask for. If the circular house is not too large, the owner could swing it at any time by reaching one of the rafters overhead, and giving it a push. Of course, the expense of such a structure would be pretty heavy; and setting glass on a circular sloping roof is very expensive business.

†There is a pleasant feature about having the plant-beds on wheels. For economy of space they could be pushed tight up against each other, occupying all the space usually used for paths or alleys, leaving room for only a single walk, on the south side of the house, for instance, so a walk can be made anywhere you wish by pushing the beds apart—that is, spreading them wherever you want to get in, instead of having the vacant space on the south side, as mentioned. This arrangement would also prevent dampness and mold, because the beds could be moved apart so as to let the sun and air all around them, underneath as well as overhead. The principal expense would be a level substantial track, with strong accurate wheels and axles, so the beds would move with very little pushing. I would adopt this plan were it not for the expense of the extra ground that can not, as I see, be made available for any other purpose; also the expense of the track, wheels, and axles. Possibly the plant-beds may be floated on water, like a canal boat, cheaper than to put them on a car.

vent the wind from blowing it down. Cloth frames answer excellently until we have heavy snows. I never want any thing to do with cloth frames when we have snow even half a foot deep. They may answer in October and November, and perhaps in March and April; but here we are liable to have snows that make trouble, both in November and March.*

Now, I have given the above as much with the idea of possibly receiving some hint or suggestion from some of my readers as with the hope that it may prove helpful to those who have been studying along in the same line with myself. I would suggest an easy method of having flowers and vegetables, that might need fall protection, and yet have the apparatus at all times present a neat and tidy appearance.



Let A represent a plant-bed; but instead of having it 6 feet wide, let us have it only 3. The dotted line represents the height of the soil. The sides may be made of boards held in place by sticks. These boards must be 18 inches if the bed is 3 feet wide. B B are cloth frames hinged at C. The hinge may be of leather, or even the edge of the cloth tacked to the board forming the side of the bed. Now, when it is frosty the frames B B are turned over so as to cover the bed, resting on a stake just above the letter A. When they want sunshine or rain, raise them up and let them drop down by the sides of the bed shown at D. The wind can not hurt them in this position; and if the bed is not very long, you can open or close the frames by standing at the head of the bed and taking one in each hand. Glass may be manipulated in the same way, only that it would be pretty heavy, requiring a man at each end, say for a bed 15 or 20 feet long. Another objection to this arrangement is, that the soil, being 12 or 15 inches above the surface of the ground, would freeze through quicker than if the path were not so far below it. Peter Henderson once said to me that he had got tired of hot-beds or cold-frames where one could not come inside to regulate the temperature, and I think a good deal the same way. I want to be inside, not only to see what is going on, but I like to be where it is warm and comfortable; and if it is too hot or too cold, turn the aforesaid crank one way or the other.

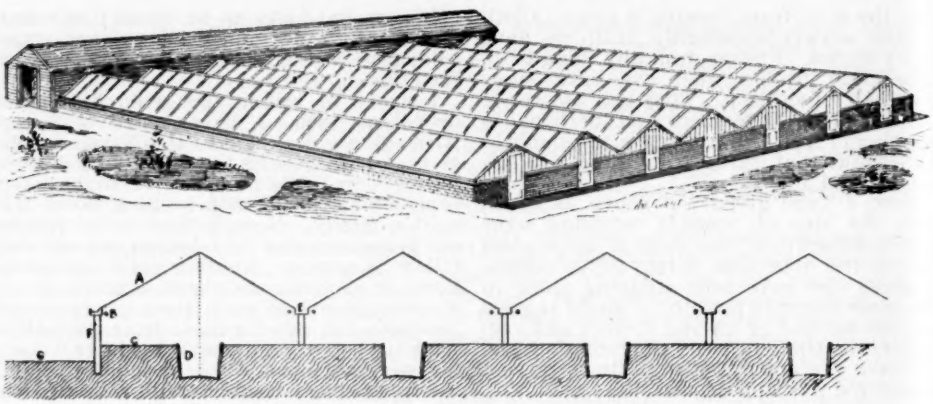
I spoke of killing the green flies by a drenching rain. I have tested watering with a fine spray, such as the Nixon nozzle gives, and this seems to answer a good purpose. Very likely the dews of night have considerable to do with keeping down the aphide family. Now, if there is no dew in our greenhouses or cold-frames, we are not following nature. Another point comes in here: If we water the plants so profusely as a shower of several hours, there must be some provision not only for rapid drainage, but to have the soil dry out as it does in the open air we must have a *movement* of the air. Stirring the soil, together with a circulation of warm air, will dry out the ground as it dries outdoors. Now, when the weather is too cold to allow us to open the ventilators for many days, do not our plants suffer from a lack of air? And this suggests the thought that has often come to me—why not warm greenhouses as we often do dwellings and public buildings, by blowing through them a current of warm air? One of our factories is warmed and ventilated in this manner, and it is the most satisfactory warming we have ever had. A very gentle blast of air—perhaps just enough so that the warm air is slowly pushing out through all the crevices, will accomplish the result; and as this would prevent cold air from pushing in at the crevices, may it not be as cheap a method of heating as any? I have never succeeded in getting any satisfactory growth of plants unless very profuse watering was followed by the gradual drying-out of the soil until another profuse watering could be administered with safety. Watering, without giving the soil time to dry out, produces dampness and mold, which very soon destroys most plants. The great troubles that have come from the rotting of lettuce in greenhouses seems to me can be accounted for by a want of dry air to dry out the soil, as well as for want of sunshine. Running steam-pipes underneath the beds is a pretty good way of accomplishing the result. But steam-pipes will never dry any thing unless a circulation of air is also assured. We once built a dry-house, and were surprised to find the lumber would not dry, no matter how hot we made it. When we sent a stream of air over the steam-pipes to warm it, and then passed it through the lumber and out into the open air as fast as it became loaded with moisture, then our lumber dried out promptly. Do we not need something of the sort in our greenhouses, especially during the winter months when we have many cloudy days and little sunshine?

Since Peter Henderson's arrangement above alluded to comes the nearest to filling the bill of any thing we have as yet found, I have thought best to submit it on the next page, with an explanation in Peter Henderson's own words:

LOW GREENHOUSES, OR PITS.

There is nothing new in the plan; it is almost identical with what we and others have had in use for the past thirty years, except it be that, instead of lifting the sashes individually for ventilation

* There is one way by which cloth frames may be made to answer all winter. Have shutters to put over them when more than half a foot of snow comes or is expected to come. The air space between the cloth and the shutters is an additional help to keep out the frost. When the snow has ceased falling, and the sun comes out, or if the temperature is mild, even if the sun does not come out, throw up the shutters. This makes additional work, but it will give very good results for a cold-frame. It is not, however, as good as glass, and is considerably more trouble.



SECTIONAL VIEW OF LOW GREENHOUSES, OR PITS.

A. Sash, 6x4 ft. B. 1¼-inch steam-pipe. C. Cemented bench, 4½ ft. wide. D. Walk, 2 ft. wide and 6½ ft. from ridge. E. Yellow pine gutter, 10x4 inches. F. Front wall, 3½ ft. high. G. Ground-level.

with an iron bar for a lever, we now apply the ordinary hoisting apparatus, so that every alternate sash on the south side can be lifted to a height of nearly four feet. This was the great desideratum in our first erections of these low houses, whether of fixed roofs or portable sashes, that for the purposes for which such houses are best adapted—the growing of hardy and half-hardy stuff—sufficient ventilation could not be obtained. These low houses are formed of sashes 6 x 4; the glass is double thick, 10 x 14. All sashes on the north side are screwed down, also every alternate one on the south side, the others being used for ventilation. This abundant means of ventilation makes such houses adaptable for any purpose that cold-frames or sunken pits are generally used for, such as the growing of violets, pansies, daisies, bulbs of all kinds, or, in short, any plant whose nature rebels against a high temperature in a dormant state. For dormant hybrid roses, clematis, hydrangeas, and carnations, we find them particularly useful, and we never before have had such satisfactory results from that class of plants.

The space occupied by these houses on our place is 300 feet long by 90 feet wide. The length is crossed by two potting-sheds each 15 feet wide. As will be seen by the ground plan, the paths are sunk, the sides of which are held up by brick on edge laid in cement; the benches are all cemented, thus always presenting a clean, smooth surface on which to set plants. The posts supporting the yellow pine gutters are locust, so that houses so built, we believe, will stand for at least twenty-five years, with but a trifle for repairs. The heating is done by steam, by three of Lord & Burnham's No. 5 hot-water boilers with a steam-dome attachment. The two 1¼-inch pipes in each house are attached to the gutter-plate, as shown in the plan, which is sufficient to keep out frost in coldest weather; if heated by hot-water it would require exactly the same amount of four-inch pipe to do the same work. It is in such conditions as we have here, however, where steam has the advantage over hot-water, the extreme point to be heated being nearly 600 feet from the boiler-pit: it would hardly be practicable to heat with hot water at such a distance.

This block of pits was erected by Lord & Burnham, and cost $7.50 per running foot, for each house, complete. This, of course, far exceeds in cost that of the ordinary sunken pits, which we used for the same purposes, sometimes using them as sunken hotbeds, heating by manure; but two years' working of this new plant has convinced us that we would have been many thousand dollars in pocket had we made the erection years ago instead of bungling along with the cold sunken pits, because, not only is there always loss by breakage in matting up such pits, but often great loss to plants is sustained from snow-storms when the pits have to be kept closed. As a matter of fact, although the area covered by these low houses is considerably less than we had in sunken pits and cold frames, our output of plants has been more than doubled, and at much less expense in labor. Against that, of course, is the cost of fuel, which I estimate to be only about $500, as the temperature is at all times low, but, taken all together, it is perhaps the most satisfactory change in our greenhouse plant that we have ever made.

Although we use these houses only for half-hardy stock, and keep them at a low temperature, of course they can be used for other greenhouse stock by increasing the heat; but for growing flowers in winter, or for growing plants requiring a high temperature, such houses are not so well adapted as the modern rose-house, which I believe to be the best for any purpose of flowering or fruiting plants in winter. But most florists growing a general stock always find a necessity for cold-frames or retarding-pits, and for such purposes I doubt whether this style of low greenhouses can be much improved upon. PETER HENDERSON.

Jersey City, N. J., July 11, 1889.

In addition to the above, the editor of the *American Florist* adds the following:

It should be added, that surplus water drains into the cemented walk; and the houses having a slight fall, the water flows easily in the side gutters to one end, where it is carried off by a sewer. The rafters and ridge-pole are of yellow pine. It will also be noted, as shown in sketch of interior, that each sash which is raised by the ventilating machinery is provided with two arms, one on each side. At the apex of the roof the two rafters and the ridge are solidly united by a small iron truss, which is undoubtedly of considerable value in strengthening the roof and keeping it in shape.

INTERIOR OF LOW GREENHOUSES, OR PITS.

For the use of market-gardeners we should not want the top of the beds cemented—that is, *I* would not; but this, of course, is optional. If I understand it, the sides of the paths are sloping, rendering them less liable to cave in. The bottom is also highest in the center, so that the workmen would not be obliged to stand in the water. Now, instead of having only every other sash on the south side hinged, I would have them *all* hinged. See cut on previous page.

Then I should want the sash-raising apparatus capable of throwing the south sash clear over, so as to lie on the north side of the neighboring house. If fastened there so the wind can not blow it over, it can remain all summer. The last row of buildings on the south side would need a fence, or some support for the sash. When thus arranged, the sun in the winter time would shine on every inch of ground inside of the houses; and if the rain were from the south, and driven sufficiently by the wind to fall at about the same angle as the sun's rays we should also have rain on every inch of the plants; however, this would probably not often happen; therefore a part of the interior would have to be sprinkled with the hose, in the usual way.

Now, then, the problem that confronts us is this: How shall we throw the sash, or, in fact, the whole south roof, over against the north roof, and bring it back? Pulling it over with a chain or rope will not answer, because it must be held at every point so the wind can not take it and smash the glass. The mechanism must raise it up quietly and let it down quietly. For the sake of economizing power as well as time, it should commence to rise very slowly and with a good deal of power. As it nears a perpendicular position the power may be decreased, and the speed correspondingly increased; and the same way in letting it down. The ordinary sash-raising apparatus does not move the sash through, say, one-fourth, or, better still, one-third of a complete circle. Perhaps, however, it may be arranged so as to do it. It can be readily arranged so as to move more rapidly and with less power when the sash comes near the perpendicular. I have figured a good deal on levers and endless chains, and sash balanced on centers; but time and again I am driven back to the ordinary sash-raising apparatus, modified so as to throw the sash clear over against the neighboring roof.

Now, friends, I have finished my long story, and you know just how far I have got in finding my ideal winter garden.

CONVENTION NOTICES.

The American International Bee-keepers' Association will meet in the Court-house, Brantford, Canada, Dec. 4, 5, 6, 1889. All bee-keepers are invited to attend. State and district bee-keepers' societies are invited to appoint delegates to the convention. Full particulars of the meeting will be given in due time. Any one desirous of becoming a member, and receiving the last annual report, bound, may do so by forwarding $1.00 to the secretary. R. F. HOLTERMANN, Sec'y.
Romney, Ont., Can.

TO THE BEE-KEEPERS OF MISSOURI.

After conferring with several bee-keepers, and at their request, I hereby make a call to the bee-keepers of Missouri to meet at Higginsville, Mo., on Thursday, Nov. 14, 1889, for the purpose of meeting in convention, in order to form an association; meeting to commence about 9 A.M., to last for one day only. Now, brother bee-keepers, let every one, who possibly can, come to this convention, and let us get acquainted; and if it is a success, I am willing to take the honors; but if it is not, please do not mention it. It seems that somebody had to make the call, if we are to have a convention; and as no one else did, I now have done so. A place to meet at has been assured us, free of cost. J. W. ROUSE.

GLEANINGS IN BEE CULTURE.

Published Semi-Monthly.

A. I. ROOT,
EDITOR AND PUBLISHER,
MEDINA, OHIO.

TERMS: $1.00 PER YEAR, POSTPAID.

For Clubbing Rates, See First Page of Reading Matter.

MEDINA, NOV. 1, 1889.

And they were all filled with the Holy Ghost, and began to speak with other tongues, as the Spirit gave them utterance.—ACTS 2: 4.

WE have at this date 9144 subscribers.

NEW subscribers can have GLEANINGS from now till January 1, 1891, for $1.00.

THE LONG ARTICLE, GARDENING UNDER GLASS, IN THIS ISSUE.

LEST some friend who does not care for gardening should complain at the amount of space I have occupied, I want to say that I told the printers I wanted four extra pages in this issue. They said they could not very well put in just four extra, but they could make it eight. Therefore, if you will notice you will see we have given eight extra pages this time—the five that do not cost you any thing, about gardening in the winter, and three more about bees, etc.

WHO CAN FURNISH QUEENS IN NOVEMBER?

WE are just now in the same predicament we have been almost every year—lots of orders for queens, and none to be had. Will not some of our enterprising friends in the South put in an advertisement, to the effect that they can furnish untested queens to any one who wants them, as promptly as we are in the habit of sending them from here? We think it very much better for the seller and buyer to communicate direct during November and the winter months. Keep a standing advertisement all winter, of untested queens ready to ship by the first mail, and you will have a good business, even if you charge the prices given in our catalogue, for the winter months. We will make editorial mention, free of charge, in our next issue, of those who have queens on hand ready to ship.

POLYGLOT ORDERS.

WE not only receive orders in English poorly written, poorly spelled, and as indefinite as any thing can possibly be, but we occasionally have orders from our friends across the water, couched in three different languages, particularly when the writer lives on the border line between two or three countries, such as Switzerland, where French, German, and Italian are pretty well mixed up. A postal card before us starts off in French, then copies some English from our price list, substituting German adjectives, and then winds up in French. A very convenient thing is to have a linguist who can read any of the three languages,

or a mixture of the three. No matter whether it is poorly written, or even written in three languages, or a mixture of the three, our proof-reader, some way or other, manages to decipher it. This is not written to encourage polyglot writing, but to show how the people of this world do write sometimes in conveying their wants. Now, do not get discouraged, friends. We are not finding fault, but the contrary. If writing postals in three languages is the best you can do, keep on and we will do the best we can for you. You remember the central thought of Our Neighbors this issue is about neighbors who speak to us in unknown tongues.

MOODY'S SERMONS.

ABOUT a year ago, or perhaps a little more, there was quite a disappointment because we were unable to get any more of the books entitled "Moody's Best Thoughts and Discourses." We wrote to the publishers, but could not induce them to get out another edition. One of the best things in regard to the book is, that whenever it got into a neighborhood it was loaned right and left until it got worn out. For ten years past I have kept a copy in our county jail, and almost every prisoner that gets in there was sure to read Moody. After the books were gone I tried to get even a single copy to put in the jail, but I failed. Imagine my astonishment when I found out, a few days ago, that our boys had a couple of copies of Moody's Sermons in their cheap library; but instead of being 75 cts. and postage, as is the book mentioned above, the price is only 30 cts.; by mail, 10 cts. additional. One of the books is entitled "Evenings with Moody and Sankey;" the other, "Hold the Fort." The latter contains quite an extensive biography of Moody and Sankey, as well as of P. P. Bliss, the author of many of the Moody and Sankey Gospel Hymns. The other is simply a collection of sermons. It also contains an account of the revival convention held in the city of New York, in March, 1876. Each of the books contains many of the best sermons heretofore found in the Best Thoughts and Discourses. As the books contain nearly 300 pages each, they are wonderfully reasonable. For some time I have lamented that there were not more good *moral* books in our cheap library. Both of these books are intensely interesting. If you just lay them around, almost everybody will read them; and I hardly need add, that nothing in the shape of a book has a more moral tendency, or a more elevating tone, than these reports of Moody's Sermons. I can not tell you how glad I felt when I found them for sale in our store, at the low price of 30 cts. each.

SEEDSMEN, AND A LITTLE PLEA FOR THEM.

I HAVE quite a good many times heard severe and uncharitable remarks in regard to seedsmen because of their enormous profits. Somebody, for instance, grows a crop of seeds for a seedsman. The seed is furnished him to plant, and he sells matured crops, say for from $4.00 to $5.00 a bushel. A few months later, when the catalogue comes out, the price may be perhaps $15.00 or $20.00. It looks bad, I confess; and I, too, used to indulge in severe criticisms. Since I have been dealing in expensive seeds, especially of novelties or untried things, I have had my eyes opened a little. At present our seed catalogue quotes the Ignotum seed at $15.00 a pound, while we are paying only $4.00 for the same amount. Why this great discrepancy? I will tell you. In our basement is quite a lot of seeds that have cost me large sums of money. Some of them are old and worthless; others are not worth a quarter what I paid for them. I was foolish in buying more than the market demanded; yet we have been so greatly annoyed by being out of certain seeds when there came an unexpected demand for them that I have decided I would rather have considerable to throw away than to vex people by telling them we were sold out, or that we could not get any more without paying twice as much as we have been selling them for. No seedsman can tell how much he is going to need of any thing. Of course, he can tell something by past experience; but even with the best judgment he can bring to bear, he frequently gets badly "left." Now, I do not know how much Ignotum seed can be scraped up as the product of the seeds we gave away last spring; neither do I know how much is going to be called for. It is very desirable, however, that we have enough seed on hand to furnish some to every applicant. It is also exceedingly desirable for me not to have 25 lbs. (that cost me $100) uncalled for. I have not yet sold a pound for $15.00; but I have sold 6 lbs. for $36.00, and 2 lbs. for $20.00; and 8 lbs. is about all I have been able to buy so far. A good many seedsmen have asked me my best present figures. If any of you prefer to advertise what seed you have, rather than to sell it to me for the small sum of $4.00 per lb., I am willing you should do so, for I have not told this little story to excuse myself, but simply to let you see how difficult a matter it is for a seedsman who expects to fulfill all his promises, and to supply all demands that come to him for seeds. Before spring the price of the Ignotum seed may be less than $4.00. It may also be more than $15.00. Supply and demand must decide. With alsike clover and Japanese buckwheat, of course the case is far different. What we buy for a dollar we can well afford to sell for $1.25, because they are established staple seeds; but it must be remembered, that a bag substantial enough to stand shipping by freight must be furnished for each bushel, half-bushel, or even peck, and there is also some danger of having several hundred bushels of buckwheat on our hands, that cost us over $1.00 per bushel, that *might* have to be sold for even less than a dollar. Seedsmen quite frequently sell even staple seeds at less than cost; therefore they can not bring the purchase price and selling price so near each other as one might, in taking a cursory view of the matter, think they should.

PURE WATER IN GREAT ABUNDANCE.

PERHAPS 20 rods from where I am writing this there is a rise of ground, and it goes up a little higher than any other ground in the corporation, or, in fact, in the vicinity of Medina. When I was a boy in my teens I often used to look at it longingly, thinking what a grand place it would be for a windmill. Windmills were my hobby then. But I did not suppose that it would ever be my good fortune to possess the ground, or perhaps to have money enough to build such a mill as I had in my mind's eye. So I contented myself with making a homemade windmill to do the churning for mother. That was thirty years ago, when windmills for pumping were almost unknown. They now dot the landscape everywhere; and within the past few months Providence has seen fit to permit me to make a purchase of that hill I have had my eyes on for over thirty years. Three days ago, as we

looked from the windows of the office, we could see, sharply outlined against the sky, the derrick, engine, walking-beam, and other machinery for drilling an artesian well. The drillers had been working for more than a week, exploring for pure water from the depths of the rock. We expected to be obliged to go down at least 150 or possibly 200 feet, on account of the elevation. Imagine the pleasant surprise, however, to find a vein of water at a depth of 97 feet and 5 inches that gave a flow of water equal to at least 500 barrels per day, and *may be* a thousand. We are now planning for the erection of a 2000-barrel tank, to be placed over the well and a windmill capable of raising 1000 barrels per day is to spread its wings over it. Even if this reservoir stands on the ground, the elevation is sufficient to throw water on the roof of every building on our grounds; and last, but not least, to furnish, we hope, 1000 barrels of water per day for irrigating the strawberries and garden-stuff. We are just now rejoicing over this, another of God's gracious gifts. Well, the drillers have folded their tents, and the engine is to-day, Oct. 31, smiting the rock down on the creek-bottom ground, to see if it is not possible that some other gift was stored away, ages ago, through God's loving kindness for his children of this 19th century; and it reminds me again and again of the promise, "But the water that I shall give him shall be unto him a well of water springing up into everlasting life." We are planning to have all our buildings fitted with automatic sprinklers over all our ceilings, so that, if a fire should break out at any time of day or night, when nobody is around, the faithful little piece of mechanism will commence to drench the flames with water until one of two things happens—till the fire goes out, and somebody comes and stops the running water, or till that 2000 barrel tank gets empty.

THE OREGON STRAWBERRY, AGAIN.

OUR young friend Seth Winquist has just mailed us a plant, or clump of plants, in full bearing; and he packed them so nicely in moss that it reached us in perfect order. A single plant contained blossoms, growing strawberries, and ripe fruit, the latter in a state of perfect preservation, except some bruises. This single plant contained perhaps forty or fifty berries, green and ripe. One thing is certain, the berry does wonderfully in Oregon. Whether or not it will do the same here, remains to be proved. Those he has sent us are growing, but the growth is so far rather feeble. This, however, is nothing strange for the month of October. We are testing them, both in the greenhouse and outdoors.

SPECIAL NOTICES.

SPIDER-PLANT SEED.

Please do not send us any more of the above seed until further orders.

STRAWBERRIES FOR GROWING UNDER GLASS.

The new Jessie seems to be one of the most promising varieties for this purpose. If ordered before the ground freezes, say any time during this present month, the price will be the same as in the summer-time—10 cts. for 10; 75 cts. per 100. If wanted by mail, add 5 cts. for 10, or 20 cts. per 100.

FOTTLER'S BRUNSWICK CABBAGE SEED.

Several have inquired whether the Jersey Wakefield were the only stock seed we were prepared to furnish. It is the only kind, with one exception, and that is Fottler's Brunswick. It was raised by H. A. March, in just the same way he raises the Wakefield. The price will be just the same; namely, 20 cts. per ounce, or $2 50 per pound. The usual postage is to be added, if wanted by mail.

LETTUCE-PLANTS FOR COLD-FRAMES, HOT-BEDS, AND GREENHOUSES.

We have beautiful plants now ready to take from the seed-bed, of Grand Rapids, Boston Market, or Landreth's Forcing. Price 20 cts. per 100, or $1.50 per 1000. If wanted by mail, add 10 cts. per 100, or 50 cts. per 1000. The above three are the most suitable for growing under glass, of any we have tried. Landreth's Forcing is much like Boston Market, only the heads are smaller, and it makes heads a little sooner. Grand Rapids does not make a head at all, but is fit for use at every stage. When successfully grown, however, in good soil, the stalks frequently weigh a pound or even two pounds each. The latter is the leading winter lettuce now, I believe, of the world.

SEEDS AND PLANTS IN NOVEMBER.

I presume that seedsmen ordinarily have very few orders during the present month. GLEANINGS, however, has such a wide field that it is time to make garden, at least in some of the homes where it goes, every month of the year. During the past two or three days we have been having quite a lively trade in seeds, from friends in Florida and California; and we are filling an order to-day, Oct. 30, for 1000 cabbage-plants, to be sent south, that will stand in the open air safely all winter. This reminds us that, if anybody wants cabbage-plants during the winter-time, from friend March's stock seed, we shall be very glad indeed to furnish them at regular spring prices, by giving us a little notice beforehand.

WHITE-POPLAR ONE-PIECE SECTIONS.

We have just got in several thousand feet of white-poplar lumber, which is much whiter than the best basswood. We made some of it into one-piece sections, and they fold without breaking as well as basswood, for any thing we can see. We will mail a sample to any one on receipt of 4 cts. to pay postage. If we get all the lumber we want, we shall probably be able to furnish them for 50 cts. per 1000 more than basswood. For the present, however, the price will be $1.00 extra on each 1000. If any of our readers in Ohio and adjoining States live in a region where white poplar abounds, we should be glad to hear from them. The encouraging thing about this is, that we get a better-looking section, and at the same time stop to some extent the consumption of basswood, one of our best honey-producers.

PRICE OF ONE-PIECE SECTIONS.

We have for two or three years past made a cut of 50c per 1000 on one-piece 1-lb. sections, along with other makers, till the price is $3.50 per 1000. Several have written to know if we were going to reduce again this fall. We answer, No. The price is low enough. We have written to the principal manufacturers, and all agree that, for small lots, $3.50 per 1000 is low enough. Bee-keepers have reason to be thankful that the price is as low as it is. Had we not gone to the expense of over $1000 in bringing the patent suit to a successful issue, the price would be more likely $4.00 to $5.00 per 1000. Having gone to that expense in the interests of bee keepers at large, we should like to sell sections a *little* above cost to make up that expense. Of course, if other makers can furnish sections in small lots for less than $3.50, they are welcome to do so; but we think it would be better to have a uniform price.

GLEANINGS FREE TO NEW SUBSCRIBERS FROM NOW TILL JANUARY.

Our annual premium list will be out with the next number—that is, Nov. 15. It will be at least 20 pages with a cover, and there will be many inducements for repaying a little effort on your part in soliciting your neighbor bee-keepers to subscribe. We do not believe in praising up our own publication, as many do, and say it is better than ever before; and, in fact, we don't need to. We have the kind words of many readers, telling us how you appreciate our efforts toward making GLEANINGS valuable. The more names you can send us, the better we can make it. As an extra inducement, you may offer the rest of this year

free to new subscribers. Remember it is only the numbers remaining after the subscription is taken that we give free, so it is to their interest to subscribe at once. When the premium list comes out with the next number, we will make further announcements; and we trust many of you in the meantime will secure a good number of names.

A BUSH LIMA BEAN AS LARGE AS THE POLE LIMAS, AND AS EARLY.

Mr. J. Atlee Burpee has been kind enough to send me a single plant, that in every respect seems to be like the Henderson or dwarf Sieva lima bean, only the pods are full size. He will offer the beans for sale next year in limited quantities, but as yet no price has been fixed on them. This bean, we are told, was from a sport from the regular pole lima beans, and is just like them, except it does not need a pole to run on.

ADVANCE IN THE PRICE OF HONEY-EXTRACTORS.

We have sold, in the past, over 10,000 of our Novice honey-extractors, and the complaints in regard to them have been very few indeed. Some few, however, have complained that they are too light, and others that the honey-gate is a little too small, so that real thick honey will not run through it as fast as it is extracted. Another source of complaint has been that the honey was thrown over the edges because the can was not quite deep enough. We have decided to remedy all these defects, but will not be ready to place any new machines on the market before March or April. We make this announcement at this time so that, when new lists are printed, the correct price may be put in. We have outlined the improvements to be made, as follows: The bore of the honey-gate at present is 1⅛ inches. We expect to make it about 1½ inches. We have heretofore made the extractors of IX tin, and of several pieces. We have ordered a special importation of IXX tin in large sheets, so as to make one entire can of one sheet. These sheets are large enough to make the cans two inches deeper than at present, to prevent the honey from being thrown over the edge. The bottoms of the large cans, 20 inches in diameter, will be IXXX tin. These extractors will be worth fully twice as much in point of wearing qualities as the old ones, and yet we shall advance the price only to what it was two or three years ago; namely, $1.00 more than the present price. The revised price will be as follows: Numbers 1, 2, 3, 4, and 5, $7.00 each. No. 6, $7.50; and Nos. 7, 8, and 9, $8.00. We will also furnish an upright gearing, which some prefer, for 50 cents additional. We shall then have, we think, the best extractor, for the money, in the market.

KIND WORDS FROM OUR CUSTOMERS.

The queen shipped in August was received in good order, and has been safely introduced twice. I have hatched some fine queens from her.

ARTHUR SHEPARDSON.

Freeport, Wash. Ter., Oct. 10, 1889.

The plants were received in good condition. I am surprised at the size of the asparagus-plants. I did not suppose they would be so large at that price. K. A. CLARKE.

Groton, Conn., Sept. 23, 1889.

GOOD ADVERTISING.

Please tell the friends not to send me any more orders this fall, for I have as many booked as I can fill. I return seven orders to-day, which I could not fill. Does *everybody* take GLEANINGS?

Morgan, Ky., Sept. 24, 1889. J. P. MOORE.

The 60-lb. square tin cans are received, and are very nice. I have been shipping honey to all parts of the U. S. Surely it pays to advertise in GLEANINGS. E. J. BAXTER.

Nauvoo, Ill., Oct. 14, 1889.

The goods I ordered of you arrived safely and in good order. I am much obliged for your prompt attention. Although I live in the northern part of Michigan, I was extracting with the extractor the fourth night after ordering it. GEO. HALL.

East Tawas, Mich., Aug. 4, 1889.

VALUE OF THE HONEY COLUMN AS AN ADVERTISING MEDIUM.

I received an offer from Plymouth, Ohio, for the rest of my comb honey, and all my extracted, in answer to your insertion of my advertisement of honey for sale, and I am more than ever convinced of the value of GLEANINGS, both to producers of and dealers in honey and supplies, and tender you my sincere thanks for the favor. W. R. HASLET.

St. Anthony, Ia., Oct. 7, 1889.

I write to inform you that the Barnes combined saw came all right, and in good time. The reason I have not written sooner is, I wanted to try it before I said any thing about it. I have worked in wood for the last 45 years, so that I think I am competent to judge about the work it will do. It does all you claim for it, and will fully answer all the purposes that I desire. Many thanks to you and the Barnes Brothers for the machine, which I think now I can't do without. THOS. CHAPMAN.

Rocheport, Mo., Oct. 14, 1889.

A KIND WORD FOR GLEANINGS, TOGETHER WITH A GOOD TESTIMONY FOR CHRIST JESUS.

Dear Friend:—May the Lord bless your good work in the Master's vineyard, is my prayer. I read GLEANINGS, and it does make my heart rejoice to see the good work go on. I read GLEANINGS with pleasure. So far as the smokers are concerned, I hold that, if the heart is clean, the mouth will be clean too; for out of it are the issues of life. I have not used tobacco in any form since my conversion. G. D. KUNKE.

Sprague, Wash. Ter., Sept. 25, 1889.

A PLEASED A B C SCHOLAR AND HIS SUCCESS.

Those nice honey-jars arrived all O. K., as they were packed very nicely indeed, and I am much pleased with them, as also the vise and match-safes. I took the premium again at our State Fair, and almost everybody expressed themselves as seeing the finest honey in the world, and those nice white sections of yours "took the cakes." "Oh what nice white honey!" or, "how nice and clean those sections look!" As they looked on, they found some very fine extracted honey in your glass jars; also the expressions I heard were numerous, and greatly to the credit of A. I. Root; for if it had not been for him and his A B C, I am pretty sure I should not now be so far advanced, for it was only a few years ago that I was a perfect "novice" in the business, and had not even seen a queen; but now I am pretty sure I can tell one, as I breed all my queens myself. Well, I think that, if we all try to put our honey up in good shape, and in nice and attractive packages, we shall all do well. For instance, here in my own town of Reno there is lots of honey brought into the market which sells for from 12 to 15 cts. per lb., and I command $20 to $25 per hundred pounds. Now, how is it? I will tell you. The former is brought in boxes, leaky, and partly filled, and the very looks of it is enough to condemn it, while that of mine is all clean, and packed in your nice 12-lb. shipping-boxes, and, as a gentleman said to me yesterday, "You deserve a great deal of credit for putting your honey up in such attractive packages." You know the ones I got of you with glass on both sides, so they would show three sections on each side. I have just received a premium from San Francisco, from the Mechanics' Fair, the finest and best in the State of California. I try hard to do my best, and I hope all others will do the same. E. A. MOORE.

Reno, Nev., Oct. 17, 1889.

LITHOGRAPH LABELS

In 12 Colors, at $2.00 per 1000.

The 12 colors are all on each label. They are oblong in shape, measuring 2⅛x2⅝. They are about the nicest labels we ever saw for glass tumblers, pails, and small packages of honey. We will mail a sample, inclosed in our label catalogue, free on application, and will furnish them postpaid at the following prices: 5 cts. for 10; 35 cts. for 100; $1.20 for 500; $2.00 for 1000. A. I. ROOT, Medina, O.

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Cheap TUMBLERS & MUGS

If you intend to put up any extracted honey in glass for the retail trade it will pay you to send a postal to the undersigned for price list of tumblers and mugs, also labels suitable for the same.

20-21-22d **M. H. TWEED,**
154 Webster St., Allegheny, Pa.

☞In responding to this advertisement mention GLEANINGS.

APIARIAN SUPPLIES CHEAP.

BASSWOOD V-GROOVE SECTIONS, $2.75 to $3.75 PER M. SHIPPING-CASES VERY LOW.
SEND FOR PRICES.

GOODELL & WOODWORTH MFG. CO.,
3tfdb **ROCK FALLS, ILLINOIS.**

☞In responding to this advertisement mention GLEANINGS.

BEES SEND for a free sample copy of the BEE JOURNAL — 16-page Weekly at $1 a year—the oldest, largest and cheapest Weekly bee-paper. Address
16tfdb **BEE JOURNAL, Chicago, Ill.**

RERUM COGNOSCERE CAUSAS,

TO know the Causes of Things, is the key to Success in any industry. If you wish to succeed in the **Bee Business,** you must read and become acquainted with the most Successful Methods of Bee-Management and Honey-Production.

LANGSTROTH'S WORK,
REVISED BY DADANT,

Contains the result of **practical experience** with Bees. It gives the Physiology of the Bee, with numerous **Quotations** from the latest Scientific Writers, the Description of the **best Hives,** Directions for the Proper Management and Handing of Bees; the most **Practical Methods** of **Queen-Rearing, Swarming** (Natural and Artificial), with controlling methods; instructions on Establishing Apiaries, Transferring, Shipping, Mailing, Feeding, Wintering; the best methods of producing **Comb and Extracted Honey,** the Handling and Harvesting of Honey, the Making of Comb Foundation, etc., etc.

The instructions for the **Rendering of Beeswax** are alone worth the price of the Book, to many bee-keepers who waste a part of their wax in rendering it.

This book, "the most complete ever published," is shortly to be published in the French, Italian, and German Languages, by Practical European Apiarists. It is highly recommended by all publishers of Bee-Literature in the Old World as well as in the New.

Cloth Binding, 550 Pages, 199 Engravings, 19 Full-Page Plates. Gilt front and back. This book is an Ornament to any Library.

Price: By Express, **$1.85.** By mail, prepaid, **$2.00.** Special prices to Dealers who wish to advertise it in their circulars.

☞We also offer for Sale, **20,000 Lbs. of Honey,** of our crop of 1889; **25 Tons of Comb Foundation,** Smokers, Bee-Veils of Imported Material, etc. Send for Circular. Address
3tfdb **CHAS. DADANT & SON,**
Hamilton, Hancock Co., Illinois.

☞In responding to this advertisement mention GLEANINGS.

Honey Almanac for 1890.

JUST THE THING needed to create a DEMAND for HONEY at home. Bee-keepers should scatter it freely. It shows the uses of Honey for Medicine, Eating, Drinking, Cooking, for making Cosmetics, Vinegar, etc.; also uses of BEESWAX. Price 5 cts.; 100 for $2.50; 500 for $10.00; 1000 for $15.00.

THOS. G. NEWMAN & SON,
21-22-23 923 & 925 W. Madison St., Chicago, Ill.

☞In responding to this advertisement mention GLEANINGS.

NOW READY TO SHIP!

Pedigreed Poland China Pigs from 6 to 12 weeks old, from $8.00 to $12.00 per pair. White and Black Ferrets, single male, $2.50; female, $3.00; per pair, $5.00; per trio, $7.00. White Rabbits, White and Brown Leghorn Chickens, and Mallard Ducks, $1.00 each, either sex. Italian Bees in season, very reasonable. Address **N. A. KNAPP,**
Rochester, Lorain Co., Ohio.

☞In responding to this advertisement mention GLEANINGS.

BEE-HIVES, SECTIONS, ETC.

We are now selling our No. 1 V-groove sections, in lots of 500, at $3.00 per 1000; No. 2 sections at $2.00 per 1000. For price of Italian queens, foundation, smokers, etc., send for price list.

J. STAUFFER & SONS,
Successors to B. J. Miller & Co.,
16tfdb **Nappanee, Ind.**

☞In responding to this advertisement mention GLEANINGS.

THE BEE-KEEPERS' REVIEW.

A 50-cent monthly that gives the cream of apicultural literature; points out errors and fallacious ideas; and gives, each month, the views of leading bee-keepers upon some special topic. *Three* samples free. **W. Z. HUTCHINSON, Flint, Mich.**

☞In responding to this advertisement mention GLEANINGS.

KIND WORDS FROM OUR CUSTOMERS.

THAT BEAUTIFUL TESTED QUEEN.

That beautiful select tested queen arrived all right on the 25th of last month. I am well pleased with her. I think I have been successful in introducing her. THOS. A. HARRISON.
Burnet, Texas, Nov. 4, 1889.

I have been without a timepiece for some weeks, and feel so lost I am constrained to write you for another watch. The one for which I sent you four dollars was such a beauty that, as soon as received, it was vowed to a nice girl, so I want another, though a cheaper one, for myself.
Tuscaloosa, Ala. J. A. GOREE.

I received the smoker a few days after I sent. When I opened the package I was surprised to see such a new style. I have seen different kinds of smokers, but none so fine as that. I showed it to several of my friends, and they said that they will get one next spring. I am well satisfied with the smoker. I would not have any other kind.
Rahway, N. J., Oct. 27, 1889. V. N. BAGLEY, JR.

A GRAND EXCURSION THROUGH THE WEST.

Please state that a grand excursion leaves York, Neb., Dec. 3, for Washington Ter., via Denver and Colorado Springs, Salt Lake, Sacramento, Cal., Salem and Portland, Oregon, to Seattle; thence back, probably by Spokane Falls and Cheyenne to the starting-point. Round trip for $60.00. Reduced hotel fare, and best of privileges; our own car clear through. We should like to have Uncle Amos along. He might see some fine views to snap his Kodak at; and, indeed, we expect to have a good time. Any one wishing to go, please apply to me for any other information. R. R. RYAN.
Bradshaw, Neb., Nov. 2, 1889.

HONEY COLUMN.

CITY MARKETS.

NEW YORK.—*Honey.*—There is a fair demand for comb and extracted honey. Western comb is arriving freely; and although our market is not overstocked, prices have to be shaded in order to make sales. Off grades and mixed comb honey is accumulating, and there is no demand for the same. Several lots we sent out were rejected on account of poor quality, and left on our hands. Such honey will have to be sold at whatever price it will bring. We quote: Fancy white, 1-lb. sections, 14@15; 2 lbs., 12@13; off grades, mixed, etc., 10@12; buckwheat, 1 lb., 10@11; 2 lbs., 9. Extracted, white clover and basswood, 7½; orange bloom, 8½; California, 7½; buckwheat, 6; Southern strained, 70@75c per gal.
HILDRETH BROS. & SEGELKEN,
Nov. 6. 28 and 30 West Broadway, N. Y.

CHICAGO.—*Honey.*—Honey is selling quite well at the following prices: 13@14 for choice to fancy white comb in 1 lb. sections, where cases and frames are equally desirable. White comb in 1-lb. sections, not choice, in some necessary way sells at about 12; 1½ to 2 lb. frames, white, 10@12. Fall honey, buckwheat, etc., 8@10. Extracted, dark to extra white, 6, 7, and 8. Arrivals are about as usual for the season, when there has been a fair crop. *Beeswax.*—Yellow, 25; dark, 20. R. A. BURNETT,
Nov. 9. 161 South Water St., Chicago, Ill.

ALBANY.—*Honey.*—Market is depressed under heavier receipts and lighter demand. The crop is turning out to be much heavier than represented, and the best price of the season has been made. We quote: White, No. 1, 14@15; No. 2, 12@13; mixed, 11@12; buckwheat, 10@11; common, 8@10. Extracted, buckwheat, 6@6½; clover, 8@8½.
Nov. 11. H. R. WRIGHT, Albany, N. Y.

CINCINNATI.—*Honey.*—There is no boom in the honey market, but demand is fair for extracted honey at 5@8c on arrival. There is also a fair demand for comb honey, at 14@16c in the jobbing way for best white in 1-lb. sections. Arrivals are plentiful. *Beeswax.*—Demand is good at 20@22c on arrival, for good to choice yellow.
CHAS. F. MUTH & SON,
Nov. 9. Cincinnati, Ohio.

MILWAUKEE.—*Honey.*—The movement of honey is slow, yet a steady consumptive demand exists. Choice white, 1-lb. sections, 14@15; 2 lbs., 13@14; old dark, 1 lb., 10; new dark, 1 lb., 10@11. Extracted, white, barrels and kegs, 7@8; tin and pail, 8@8½; dark, barrels, 6@6½; kegs, 6@7. *Beeswax* in demand at 22@24. A. V. BISHOP,
Nov. 11. Milwaukee, Wis.

KANSAS CITY.—*Honey.*—White 1-lb. sections, 13@14; dark, 10@12; white, 2 lb., 12@13; dark, 10x12. Extracted, white, 7@8; dark, 5@6.—*Beeswax*, none in market. CLEMONS, CLOON & CO.,
Nov. 4. Kansas City, Mo.

ST. LOUIS.—*Honey.*—Market steady. Better inquiry. Comb, 12½@14 for choice; 8@10 for interior. Choice extracted, 5¾@6; dark, 5@5½. *Beeswax.*—Prime, 22. D. G. TUTT GROCER CO.,
Nov. 11. St. Louis, Mo.

PHILADELPHIA.—*Honey.*—We have a clever demand for pure extracted honey, in small good-style packages, at 10@12½c; and fair demand for 1 lb. sections, at 14@16c. PANCOAST & GRIFFITHS,
Nov. 5. 122 Dock St., Philadelphia, Pa..

DETROIT.—*Honey.*—Comb honey is selling quite freely at 13@15c. Supply is about equal to the demand. Dark or fall honey is more plentiful than white. *Beeswax*, 24@25. M. H. HUNT,
Nov. 11. Bell Branch, Mich.

KANSAS CITY.—*Honey.*—White, 1-lb. fancy, 14; good, 13; dark, 11; white, 2 lb., 13. Extracted, white, 7; dark, 6. Demand good. Bee-men find sellers at above prices. HAMBLIN & BEARSS,
Nov. 11. 514 Walnut St., Kansas City, Mo.

FOR SALE.—One ton of nice comb honey in 1-lb. sections. I want 12½ cents, on board cars.
22d N. L. HIGBIE, M. D., Elsie, Clinton Co., Mich.

FOR SALE.—Comb honey by
M. ISBELL, Norwich, N. Y.

WANTED—Honey. Write to
CHAS. S. STRONG, Plymouth, Ohio.

FOR SALE.—White-clover honey in 63-lb. cans (2 in a case), or 12-lb. cans (10 in a case), at 8c, or 7½ in barrel lots. H. W. TUNK, 22tfdb
Box 1156, Bloomington, McLean Co., Ill.

FOR SALE.—I have 6000 lbs. of fine light yellow honey, basswood and goldenrod mixed, in barrels, weighing from 200 to 600 lbs. What am I offered?
E. S. FOULKS, Grant Center, Monona Co., Iowa.

FOR SALE.—100 lbs. of buckwheat honey in 1-lb. sections, and 100 lbs. of clover extracted in tin pails, all at 9c. per pound. H. A. HUBBARD,
New Lisbon, N. Y.

FOR SALE.—1000 lbs. of basswood extracted honey in 60-lb. shipping-cans, at 10 cts. per lb., and 500 lbs. of white comb honey in 1-lb. sections at 15 cts. per lb., delivered f. o. b. Address A. P. SHARP. 22d
Exeter, Luzerne Co., Pa.

FOR SALE.—About 600 lbs. of A No. 1 basswood honey, 7c per lb., in barrels or 70-lb. cans. No charge for packages. You need not send for samples. I will guarantee it first-class in every respect.
22d H. O. MCELHANY, Cedar Rapids, Iowa.

FOR SALE.—200 lbs. of No. 1 clover and 500 lbs. of heart's-ease honey, in 1-lb. sections, put up in glass-front cases holding 24 lbs. each. I will sell the clover honey at 13c. and the fall honey at 11½c per lb.
22d G. D. BLACK, Brandon, Buchanan Co., Iowa.

FOR SALE.—About 2500 lbs. of white-clover honey. About half of it is in 12-lb. cans, 12 in a box, and half in 60-lb. cans. Cans all screw top, and nicely labeled. How much am I offered for the lot on track here? E. A. SHELDON,
22d Independence, Buchanan Co., Iowa.

FOR SALE.—I have a quantity of choice clover honey in scant 1-lb. sections, and 12-lb. cases, at 15c per lb. (100 lbs. or more). Also 60-lb. screw-cap cans of extracted clover honey at $4.90 per can; 2 cans in 1 box, $9.60. Safe arrival guaranteed by freight.
OLIVER FOSTER, Mt. Vernon, Linn Co., Iowa.
17tfdb

FOR SALE.—I still have about 4000 lbs. choice extracted white clover honey. I have also about as much nice Spanish-needle honey, which I consider as fine as the best goldenrod. Write me for price list. EMIL J. BAXTER, Nauvoo, Han. Co., Ill.
21tfdb

Ho! Ye in Dixie Land!

LEARN SOMETHING NEW

Of Interest to You in my New 1890 Catalogue

MAILED IN DECEMBER.

Enlarged, and prices reduced. It gives LOW SPECIAL FREIGHT RATES to many Southern points, especially to points in *TEXAS*.

Southern Bee-Keepers, Send for it NOW.

J. M. JENKINS, - Wetumpka, Ala.

☞In responding to this advertisement mention GLEANINGS.

SECTIONS and FOUNDATION.

WHOLESALE AND RETAIL.

All supplies cheap. Send for new price list free.
22tfdb **W. D. SOPER,**
Box 1473. Jackson, Mich.

65 SWARMS OF ITALIAN BEES. Langstroth hive, Gallup frame, 60 to 80 lbs. of honey in each. Price $5 00 on board cars. Address
22d N. L. HIGBIE, M. D., Elsie, Clinton Co., Mich.